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MISSOURI BOTANICAL GARDEN

BULLETIN

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Bulletin Missouri Botanical Garden

WILLIAM McKINLEY KLEIN, JR. APPOINTED ASSISTANT DIRECTOR

Dr. Peter Raven, Director, has announced the appointment of Dr. William Klein, Jr., as Assistant Director of the Missouri Botanical Garden. Born in Galveston, Texas in 1933, Dr. Klein received his early education in South Dakota and Colorado. Bachelors and Masters degrees were taken at Colorado State University where he majored in Range Science (B.S. 1955) and Botany (M.S. 1957). His doctoral degree was conferred (1964) by the Claremont Graduate School and University Center in Claremont, California where he studied under Dr. Philip A. Munz, director emeritus of the Rancho Santa Ana Botanic Garden. The topic of Dr. Klein's dissertation was a biosystematic study of four species of evening primrose and evolutionary studies in this group of plants continue to be a major research interest.

From 1961 through 1965 Dr. Klein served as an officer in the United States Air Force assigned to the Biological Systems section of the School of Aerospace Medicine at Brooks AFB in Texas. During this period his research activities were devoted to studies on plants, primarily the duckweeds, that were being tested as components of life support systems for extended space missions. It was during this time that Dr. Klein advanced his interests in ecology and various environmental concerns that he has continued to pursue since.

In 1965 Dr. Klein was appointed as an assistant professor in the Botany and Plant Pathology Department of Colorado State University. Teaching responsibilities covered both the beginning and advanced courses in systematic botany. And through this teaching involvement he developed some of the multi-media techniques that he is planning to use at the Missouri Botanical Garden. His teaching and research interests have also taken him to Afghanistan, Indonesia, the Aleutian Islands, Mexico and England where he has photographed extensively and developed a very sizeable slide library that he uses to good advantage in his teaching programs. Dr. Klein has also assisted in the development of a program in television teaching of biology at Colorado State University.

In addition to his formal teaching activities, Dr. Klein has also been active in extracurricular programs in environmental education. He has served as faculty advisor to the Environmental Corps (ECO) which has sponsored a variety of environmental programs ranging from recycling and public school education to legislative action. During the AIBS meetings last fall through his direction this student group conducted a highly successful symposium treating the biologist's role in land-use planning.

Dr. Klein's research interests in recent years have taken a strong turn to the environmental concerns and the application of basic botanical data, both systematic and ecological, to problems of land-use planning. This direction grew in part from his studies of the flora of Amchitka Is. Alaska where he was working on the effects on vegetation of disturbances

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associated with underground testing of nuclear devices. Such interests over the past two years have been promoted through a research program he has helped institute titled "The Vegetational Resource Inventory of Colorado." This is a computerized mapping and information retrieval system based upon the use of floristic and vegetational data. The system has been developed to promote the incorporation of biological data in land-use planning and also to serve as a tool to advance basic botanical investigations. Dr. Klein and a colleague, Dr. Robert Adams, are co-principal investigators on this project. These land-use planning interests have also been recently carried into a business venture and the establishment of a private consulting corporation of which Dr. Klein is the president. The corporation has been engaged in the development of reclamation plans for mining operations, preparation of environmental impact statements and the planning of Environmental Education Centers for the Denver Public Schools and Jefferson County Schools.

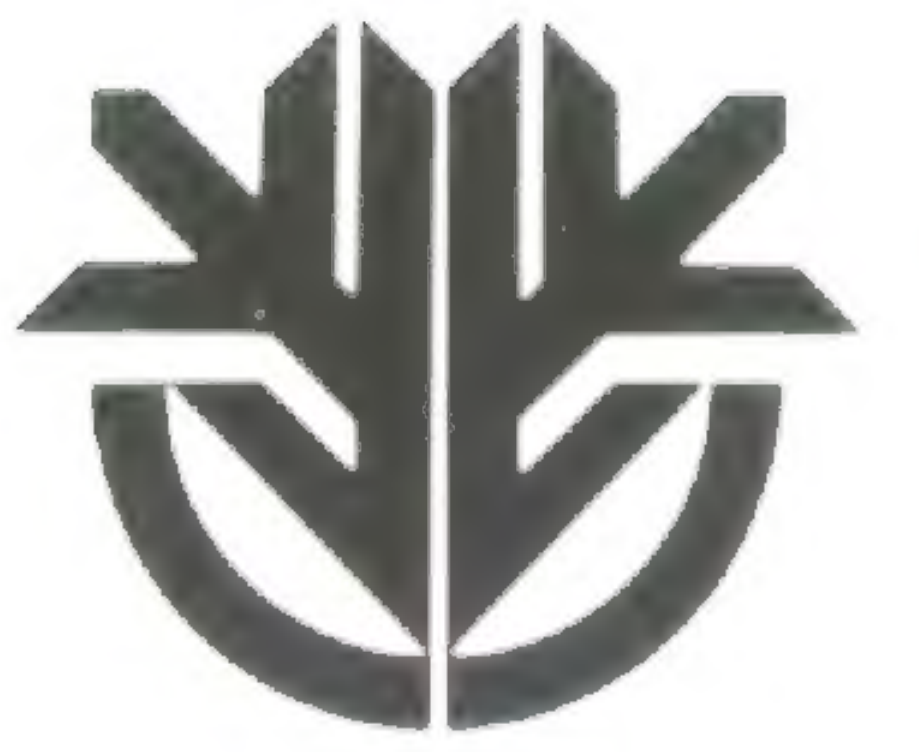
Civic activities both in the areas of education and environmental concerns have also occupied Dr. Klein's time. He has served as chairman of a Montessori School and the Land-Use and Water Resource subcommittee for a citizens' planning group. Dr. Klein has also been a guest speaker for many of the service clubs in Fort Collins, biology departments at a number of universities, and various state and federal agencies throughout the country.

With regard to his new position as Assistant Director of the Missouri Botanical Garden, Dr. Klein states that "I see unique opportunities in the areas of public education and the promotion of basic botanical interests. The Missouri Botanical Garden has a proud tradition in both of these areas and under the leadership of Dr. Raven and with the new facilities, I feel the potentials have been greatly extended. I'm looking forward to becoming a part of that tradition."

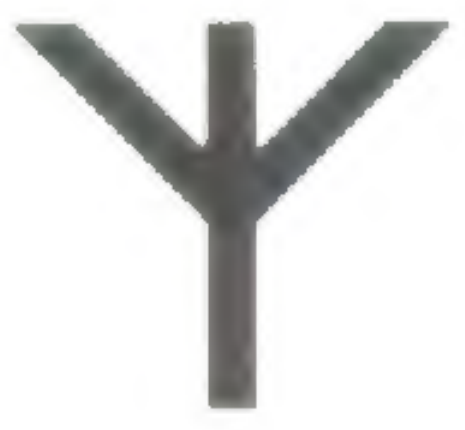
This issue of the *Missouri Botanical Garden Bulletin* appears with a new format, one which has a greater flexibility, which allows us to say so much more about gardening in St. Louis, which can be produced quickly to bring you current information. The number of issues per year will be increased from six to ten.

We welcome your comments and suggestions.

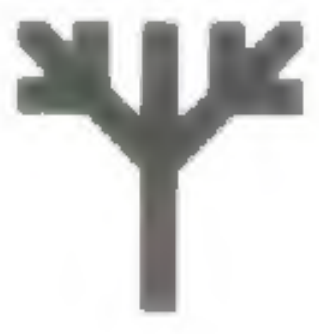
The Bulletin is published ten issues per year by the Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Missouri 63110. Second Class Postage paid at St. Louis, Mo. Volume LXI, Number 1.



NEW SYMBOL FOR MISSOURI BOTANICAL GARDEN

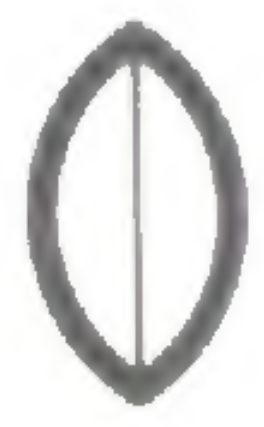


The genesis of the mark is the folk symbol for man

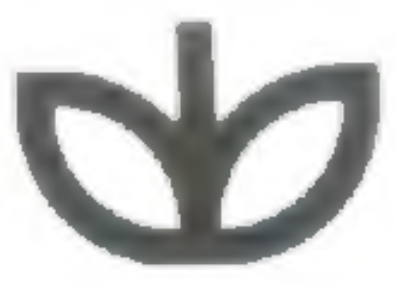


Compounded to become men (mankind) abstracted to become plant form (botanical). Reflecting the garden's dual concerns for man and the natural world. The inseparable nature of both and most importantly, their "oneness."

Also the process of research.

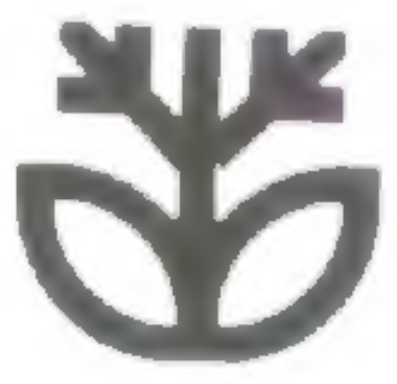


A seed pod

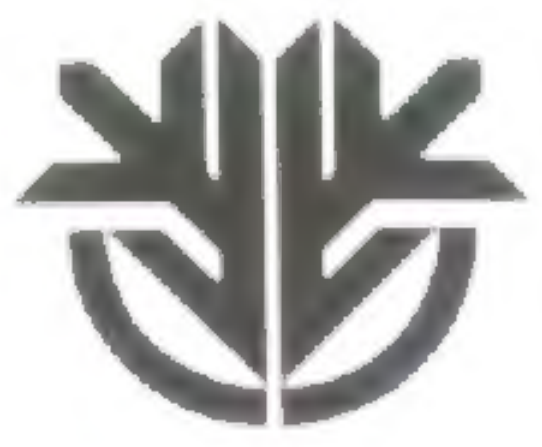


germinating

Seeking the common denominator in the plant kingdom, the point at which most things look alike, so as to represent the entire kingdom and not one part . . . newness . . . growth.



The two forms brought together . . . and divided, symbolizing in their separateness plant and man, in their symmetry or reflection the interdependence of one upon the other to create a whole, a mutual reinforcement. Again, "oneness".



The curved lower line: the garden as holding, cradling, nuturing the whole: the earth.

The new Symbol was designed by Chip Reay, of Hellmuth, Obata, and Kassabaum, Inc.

New Gardens at the Garden

SCENTED GARDEN for the BLIND

A scented garden to touch, to smell, to know beauty one can and cannot see

The inscription on a plaque in the new Scented Garden for the Blind, at the Missouri Botanical Garden, expresses the sentiments of Mrs. Eugene F. Zimmerman, whose generosity made this very special garden possible. It is given in memory of Mrs. Zimmerman's grandmother, Susannah F. Mack, who loved flowers, especially at Shaw's Garden, because she knew Mr. Shaw; and Mrs. Zimmerman's mother, Lillian C. Lowis, who had great admiration for the sightless, particularly a close friend who was blind.

The Garden was designed by Robert Dingwall, Chief Horticulturist. It consists of eight raised brick beds, 32" high. Plantings are selected and grouped for taste, for smell and for touch. To taste there are oregano, french thyme, peppermint, pineapple mint and garlic among others. To smell there are lemon balm; English lavender; anise; wormwood; and lemon, peppermint, rose, apple and nutmeg geraniums. Some of the many plants selected for touch are green santolina, wooly thyme, marigold, licorice, sedum and sempervirens.

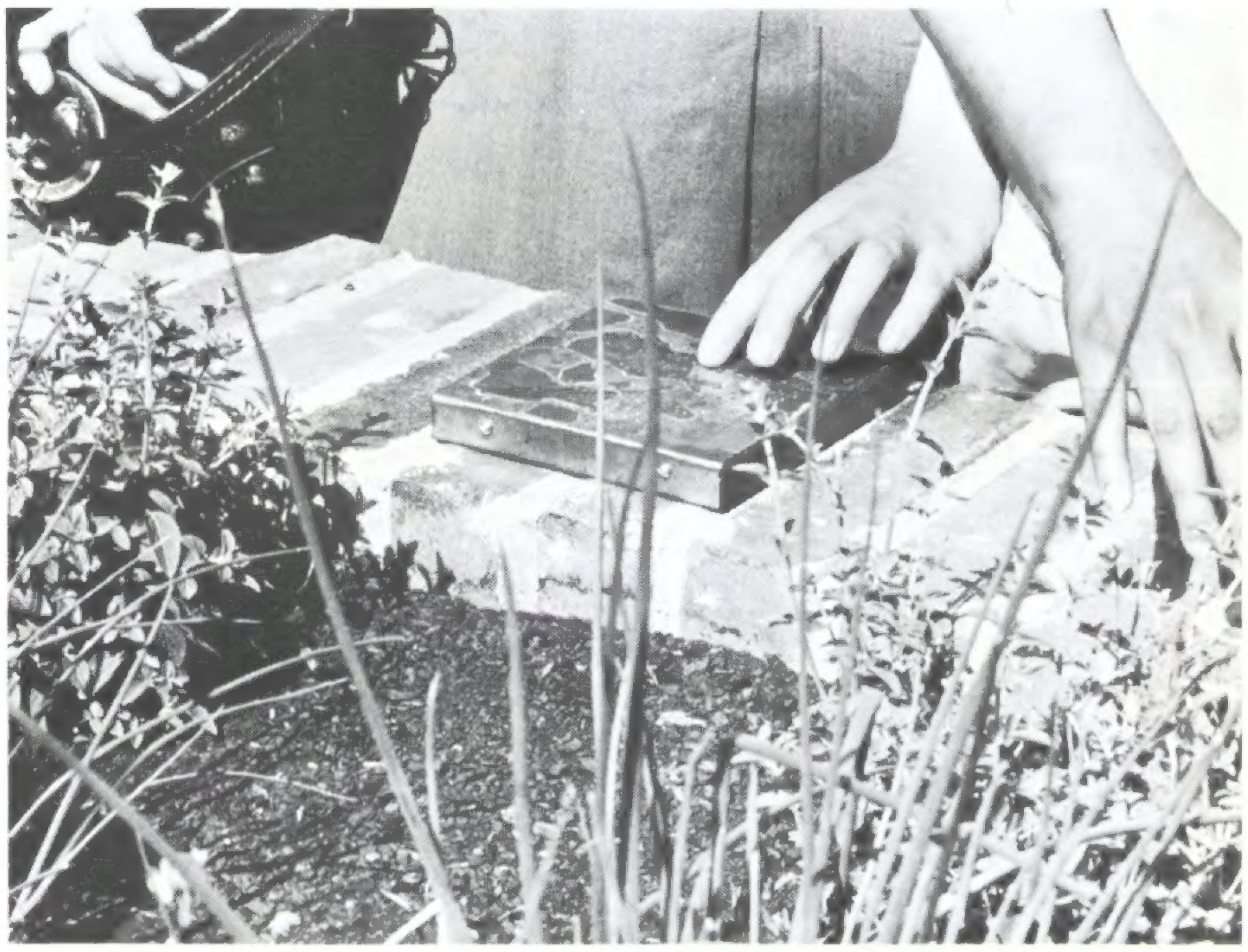
The Missouri School for the Blind at Grand and Magnolia, a neighbor of Shaw's Garden, assisted with the planning of the Garden and with the installation of Braille plaques throughout the Garden. Each plaque gives the common and botanic name of each plant, its description and uses.

To complement the formal Garden, the South Side Lions Club donated funds to allow the planting of fragrant shrubs and flowers in the Knolls adjacent to the Scented Garden.

In recognition of the generous contribution of Mrs. Zimmerman, the Board of Trustees passed a resolution at their May meeting that all blind persons and those teachers accompanying them will be admitted to the Missouri Botanical Garden free of charge.

Formal dedication ceremonies were held on May 26, with students from the Missouri School for the Blind present. It was during these ceremonies that these touching photographs were taken.

In the Scented Garden for the Blind, all visitors are encouraged to touch, to smell, to taste and to pick the flowers.



Post-Dispatch Photos by Lester Linck

Gardening in St. Louis

JULY

House plants can be moved to summer quarters in a partially shaded section of the outdoor garden. Plants growing actively will require watering and will benefit by one or two feedings with liquid fertilizer during the summer.

Start planting perennial seed – sweet william, columbine, coreopsis, delphiniums, dianthus, candytuft and hardy asters – now so that they may be replanted in your borders in late August or early September and will thus bloom next spring and summer. Annuals such as zinnias, portulaca and marigolds may still be planted by seed for late summer color.

Hardy chrysanthemums can be pinched until July 20 to encourage branching and to control their height. They may be fed liquid fertilizer for better growth.

The second sowing of beans, carrots, beets and early corn varieties can be made now for later use as garden space becomes available.

Mulching of perennials, shrubs and evergreens will help to keep down weeds and conserve moisture. Compost, wood chips and straw are all good for this.

Watch for harmful insects (ones that eat the plant) and spray off with water or rotenone and/or pyrethrum. Benlate is good for black spot and for fungus control on roses.

Remove all spent flowers from annuals and perennials so they cannot set seed. Remove spent rose blooms to encourage more flowering and watch for insect and disease problems; spray to keep them under control.

When watering the garden, place an old coffee can or other container on the grass. The sprinkler should then be left on until the container fills to the two-inch level, which takes from one to two hours. By doing this, you can be sure sufficient moisture has penetrated deeply below the ground; the rise of plant roots to the surface that light watering causes can thus be prevented.

Lawns should be watered heavily once every ten to twelve days. Spray with Diazinon for lawn webworm, if needed. Because of the present drought do not cut grass closer than two to two and one half inches.

Cuttings can now be made of many shrubs such as boxweed, weigela, privet and yews. Rooted in sand and peat or in perlite and peat, they should be placed in cold frames or in plastic-covered pots in a cool, shaded area.

Prune all hedges now and also all spring flowering shrubs. Cut back to the ground about one-third of the old woody branches in shrubs, and head back to control shape and size. Evergreens should be pruned now if this is required, leaving an inch or two of current year's growth to set new buds.

A SCENTED GARDEN FOR YOUR GARDEN

Grow a garden for scent in your own yard. Have a sweet fragrance waft on gentle summer breezes near your porch or patio, or pick flowers to bring fragrance into your home.

The garden should be in an area that is well drained and receives sun for at least half the day. The soil should be well worked to a depth of 15-18" and plenty of organic matter incorporated to hold moisture and allow for good air circulation. Bone meal at the rate of five pounds per 1000 square feet is ideal. The area for this "special garden" may be a raised bed or at ground level.

The choice of plants is legend but care must be used in selecting so as to get the best bouquet. Plants may be all perennials or annuals, or a combination of both. Plants that produce few, or no flowers may be used; select for color and texture in foliage to give accent and contrast. Flowering plants must be picked cautiously since fragrance can vary a great deal within a variety, such as roses, etc.

Herb plants – thyme, sages, mints, lavender, rosemary, lemon verbena – and annuals such as mignonette, stocks, certain petunias, marigolds, pinks and alyssum are all good choices. Bulbs such as narcissus, hyacinths, tuberose, lilies and lily of the valley; and shrubs such as boxwood, azaleas, calycanthus (strawberry shrub), witch hazel, spice bush, honeysuckles and particularly Lonicera fragrantissima are tops.

Care can be kept to a minimum by applying mulch to conserve moisture and prevent weeds from growing. An ideal mulch is a fine fir bark that is nice to look at and gives a rich brown texture to the area. Plants should be pruned occasionally to control size and shape and to prevent seed from forming. Trimmings can be left around the base.

When cutting for a showy bouquet, flowers with no odor such as snap-dragons, salpiglossis, campanulas, salvia, coleus and cosmos are beautiful. To add fragrance a few blossoms of strongly perfumed lily of the valley, tuberose, calycanthus, honeysuckle or stock can be included.

Put perfume at your feet! Fragrant flowers and herbs planted along walks will release a gentle aroma when brushed against. Plant lemon or caraway thyme on walking paths; smell what happens when the leaves are crushed as they are stepped on.

POTPOURRI

Scents from the Garden for Winter

A true potpourri contains many kinds of sweet smelling flowers or leaves, but three-fourths of the mixture should be rose petals. A rose jar contains only roses with the spices and fixative to preserve the color and fragrance. A potpourri or rose jar should be beautiful as well as fragrant. Ideally, we would use the old-fashioned, intensely fragrant roses like the Damask or Provence, but the popular tea roses dry very well with a more intense and a greater variance of color. Petals should be picked at the peak of perfection, not as they begin to fade. Dry as quickly as possible; spread thinly on screen wire or newspapers, in a warm, dry but not sunny place. An attic is excellent. Oven drying is a great help during muggy weather. Use a cookie sheet or a screen wire tray in a 150°-175° oven with the door ajar. Watch carefully not to overdo. This method preserves the color and makes the petals chip dry — which they should be. A good, simple recipe for the dry method of making potpourri:

1 gallon chip dry petals — 3/4 rose petals
3 tablespoons crushed orris root
3 tablespoons crushed mixed whole spices
Fragrant oils of your choice

Mix the orris root and the crushed spices well. Add the oil drop by drop, mixing well until barely moistened — or until a pinch will hold together for a moment when pressed between the finger and thumb. Add to the dry petals in an air-tight container — shake gently every few days. *Let age at least six weeks.*

Spices to use may be cinnamon, cloves, coriander, cardamon, nutmeg, ginger, mace and vanilla bean. Oils come in a variety of fragrances — remember a little goes a long way. Rose geranium, lemon verbena, sandalwood, patchouli, violet, lavender, jasmine, clover, bitter orange and sweet orange are a few to choose from. These can be obtained from two sources. One is Nature's Herb Company, 281 Ellis Street, San Francisco, Calif., 94102. The second source is Indiana Botanic Gardens, P.O. Box 5, Hammond, Indiana, 46325. Dried herbs add an elusive fragrance, as do tiny slivers of dried orange or tangerine skin.

Potpourri is a very personal product — an expression of you. Little additions of dried pansies, clove pinks, rose buds, daisies, whole roses, cornflowers and larkspur add color and decoration. Gather interesting flowers from the earliest crocus to the last tiny mum. A crystal covered compote is a perfect display for your potpourri. When you want to scent the room, just remove the cover and gently stir the contents — later replace the lid. This mixture lasts for years — losing some of its brightness, but becoming more mellow as it ages.

Squares of organdy or silk filled with the potpourri mixture make delightful gifts for scenting closets, drawers and linens. A sweet smelling gift brings great pleasure because it seems so much more personal, a part of you.

Mrs. Virginia Schreiber
St. Louis Herb Society

HENS AND CHICKS

Is there anyone willing to share the chicks from their hen and chicks (Sempervirens)? The Growing Center has a project in mind that requires quantities of these thumb-sized plantlets. Bring them one and all, any size, bare root, to the Growing Center. Many thanks.

Barbara Hyde

Bloomin' Corner

. . . at the Garden

Climatron
Plumeria
Passiflora (Passion Vine)
Malpighia
Clerodendron
Oleander
Hoya (Wax Plant)

Desert House
Cactus
Outdoors
Hibiscus
Roses
Annuals in variety

RESOLVE TO LEARN MORE ABOUT THE NATURAL WORLD

Books are helpful guides — bird books, insect books, flower books — and many are available in pocket form at low cost. Identify, learn the histories and life cycles of what you see. Buy books on gardening and natural history at the Garden Gate Shop, at the Main Gate of the Garden, and at the Visitor Center at the Arboretum.

SCIENCE AND THE CITY

Remarks of Dr. H. Guyford Stever
Director, National Science Foundation
Missouri Botanical Garden, St. Louis, Missouri
May 12, 1972

It is an honor to join with you in dedicating this beautiful structure in memory of John S. Lehmann. The Missouri Botanical Garden, known far and wide both as an excellent research institution and an outstanding amenity for the city of St. Louis, is greatly enhanced by the addition of this multipurpose building. While the National Science Foundation contributed to the project, it was mainly your efforts as public-spirited citizens that were responsible for getting it built.

By your dedication to this great civic asset, you have again set a valuable example for other cities of our nation. As a trustee of the Pittsburgh Symphony Society, I visited another of St. Louis' amenities, the Powell Symphony Hall, which inspired Pittsburgh to renovate one of its theaters into the impressive Heinz Hall for the Performing Arts.

I think examples such as these tend to highlight the recognition that the second half of the 20th century may go down in history books as a period of both great crisis and renewal for American cities. If that chapter is to have the happy ending I think is coming, it will be owed largely to concerned, influential citizens who cared enough about cities to preserve and enhance them. Certainly the economic and demographic forces at work in our cities cannot continue unchecked if we are to avert ever-growing trouble. Inward migration of the poor, outward migration of the affluent, declining tax base coupled with increased demand for services, breakdowns of services, breakdowns of traffic, ever-dirtier air — these are some of the familiar dynamics of urban decay.

Governments — Federal, State, and local — are taking steps to reverse these processes. However effective these steps may be, the key to urban rejuvenation lies with individual citizens, in private capacities as well as in public offices, who care about the future of our cities. Increasingly, it is our urban areas that provide an indication of how well or how poorly man is doing as an inhabitant of the earth and the master of its resources. In the 20th century, the so-called population explosion has been accompanied by what Philip Hauser calls the "population implosion" — that is, the increasing concentration of the peoples of the world on relatively small portions of the earth's surface. Hauser estimates that the 20 percent of the world's people who lived in urban areas in 1950 will increase to perhaps 50 percent by the end of the century. In the United States, the pace of this urbanization has been spectacular. When our first census was taken in 1790, 95 percent of the American people lived on farms or in small villages. Half a century ago, about 50 percent of our population lived in urban areas. Today, about three out of four Americans do. And, incidentally, in that 80 years, the center of population in the United States has marched steadily from the East to a location not too far from St. Louis.

What's more, our new-found concern for how mankind manages the earth's resources — using them with minimum waste or pollution — is increasingly an urban matter. In our own country, urban areas account for about 80 percent of the annual consumption of raw materials. Problems associated with that consumption are found everywhere in our cities.

I think a word is appropriate here about a proper perspective on mankind the prodigal consumer of resources. As much as we deplore waste — and there are sound reasons for doing so — it is constructive to accept as unchangeable the fundamental fact that man is a different kind of agent of change than other forms of nature on this planet. By virtue of his superior abilities, man is at the top of the predatory pyramid. If we are to convert the vast majority of human beings to conservation causes — saving endangered species, for example — we must do so on sound and persuasive arguments that promotion of the cause benefits man himself.

By the same token, it does not seem a realistic strategy to plan to have people sacrifice certain conveniences they have come to know in our technological culture when such sacrifice would contribute little to the solution of our problems. Recently, I read in a newspaper about a group of ecology-minded high school girls in Cleveland who have stopped using electric hair dryers. While that is a touching gesture to save a small amount of electricity, it would not seem to be, pardon the pun, the wave of the future. Rather, the solution lies in more efficient use of materials and energy in the process of transforming raw material into finished product, building products that have greater usefulness – whether it is cars that last longer or urban transit systems that make cars undesirable for commuting – and then recycling products at the end of their lives of usefulness.

Likewise, the answer to city problems is not to disperse the urban population among villages – which is what suburbs would be if there were no "urbs." In many ways, suburbs are more prodigal consumers of materials and energy than central cities are. The central city, on the other hand, was created for the purpose of processing and distributing resources efficiently and as a concentrated pool of human resources – and the city, when well managed, is still the best place for effecting economies.

Moreover, there is a sense in which cities are like those rich and variegated environments that Darwin found much better suited for adaptation to change than small islands with limited variety among species. Just as diversity in genetic makeup increases the chances for survival of a species under environmental change, so the diversity of human talents one finds in a city lends itself to innovation and experiment. New enterprises find customers, new commodities find a market, and new ideas find an audience more readily in a city than in smaller communities.

But cities can also become overly rich environments – too many people, too much noise, too many sensory inputs of all kinds. Those impassive, almost growling faces one observes in overcrowded cities often belong to people suffering sensory overload. There is a need to provide in our urban environments space to move around in, places for solitude, places that offer refuge from noise and bustle. I think St. Louis suffers this deficiency far less than many other cities. Certainly there is no more tranquil patch of city land, meant for escape from urban pressures and appreciation of nature's handiwork, than the Missouri Botanical Garden.

Our cities are worth saving. They are sensible environments for the human inhabitants of technologically advanced societies. They must be made pleasant, safe, and fulfilling environments for those who live there, and restored as an appealing habitat for those who have sought escape from cities.

To develop urban environments in ways that will allow continuing exploitation of natural resources, but with responsibility for using those resources wisely, will require the help of science and technology. I know it is customary these days to castigate science and technology as the handmaidens of waste and pollution, since it is upon scientific and technological accomplishments that so much modern industry is based.

Yet, it is clear that we could not have come this far in our journey through history without the help of science and technology. And we will not continue much further without the wisest development and application of new science and technology. Natural resources are characterized by greater scarcity and inaccessibility as time goes on, since the most accessible sources are always exploited first. It is progress in scientific understanding and ingenuity in technology that permits man to progress to lower-grade sources and to alternative raw materials when a resource is approaching exhaustion. As minerals become scarce at the earth's surface, mankind invents machines to dig deep into the earth to find new sources. He finds new processes for handling lower-grade ores. He discovers ways to make refining more efficient. To lower costs of processing, he finds ways to utilize by-products. When resources must be carried ever-greater distances to the point of ultimate consumption, man puts his ingenuity to work to find new and cheaper modes of transport.

Notice that fresh air, which used to be of such abundance as to be labeled a "free good," is now a natural resource of increasing rarity, and hence increasingly a product of technology – that is, of air conditioners and pollution control devices in factory chimneys and cars.

Increasing scarcity is a goad to technological innovation, but often man's restless spirit is creating new resources far ahead of need. Nuclear power generation is being perfected and implemented far in advance of the day when our fossil fuel supplies will be exhausted. Under sponsorship of the National Science Foundation, a number of scientists are investigating alternative sources of useful energy, such as waste heat from power plants, oil separated from low-grade oil shale by biochemical means, methane produced through photosynthesis, and solar energy used to produce synthetic fuels or converted to heat energy that can then be used to produce electricity.

Man's quest for scientific understanding and technological innovation thus are grounds for optimism. With ingenuity, we will make do with the earth's endowments for the lifetime of the planet. Unquestionably, some of our needs, and some of the luxuries we come to call needs, will become more costly. Over time, the possible increments of greater efficiency in processing a natural resource become smaller, and the alternative sources of a raw material become fewer; hence, the possibilities for new cost savings become circumscribed. Moreover, costs of energy and finished products will rise as we implement our determination to make waste treatment an integral part of processing natural resources.

Through scientific and technological research, we can also improve our urban environments, so that they become more pleasant habitats as well as more responsible consumers of natural resources. Again, let me cite some examples under NSF sponsorship. In cooperation with the Department of Housing and Urban Development, we are supporting studies of a more efficient way to supply electricity, water, heating, and other services — and to handle residential wastes — under a concept called the Integrated Utility System. Another project is seeking to improve instrumentation for use in measuring environmental pollutants that is more rapid, accurate, and economical than present devices and sensitive to a broader range of polluting substances. Here in St. Louis, NSF is sponsoring a study of the influence of pollutants and waste heat from the city on local weather patterns.

Also under way in St. Louis, is a study of the effects of carbon monoxide on inner city inhabitants. Other studies are applying a systems approach toward the improvement of municipal services such as refuse collection, utilities, and transportation. Last year, a team of researchers from the State University of New York at Stony Brook devised a plan which may save the city of New York millions of dollars through a rescheduling of garbage collection — and developed new mathematical insights in the process. They were able to match manpower on the streets to the peaks and ebbs of garbage accumulation in the city without hiring additional men and in a way that was fair and acceptable to the employees of the sanitation department.

Science and technology can contribute to the rescue of our cities, but I return to my opening contention — that it will take active, concerned citizens to effect the renewal and rejuvenation of urban environments. St. Louis is fortunate to have a tradition of civic pride and leadership among its most successful and influential citizens. This new building, and the magnificent gardens that surround it, are testimony to their dedication. On an occasion like this, there are no grounds for pessimism about the future of your city.

Dr. Stever, who delivered this speech at the dedication of the John S. Lehmann Building at the Garden, was appointed Director of the National Science Foundation last February after serving as President of Carnegie-Mellon University from 1965. He was on the faculty of the Massachusetts Institute of Technology from 1946 to 1965, and has served as a consultant to industry and the United States Government.

ECOLOGY WORKSHOP SET FOR TEACHERS

A one-week workshop in environmental education field activities for elementary school teachers and other interested persons will be offered Aug. 28 to Sept. 1 at the Missouri Botanical Garden Arboretum and Nature Reserve at Gray Summit. The 2,200-acre tract is being developed by the Garden as a center for environmental education.

The workshop, co-sponsored by the Garden and the School of Continuing Education at Washington University, will cover basic principles of ecology, botany and animal behavior.

The sessions, which do not require a science background, will be oriented toward activities, problem solving and discussion of such topics as natural communities, cycling, soil formation and natural selection.

Each of the five sessions will be at 9 a.m. at the Visitor Center at the Arboretum, which is at Interstate 44 and State Highway 100. Cost of the workshop is $40. More information can be obtained by calling 863-0100.

CAREER PROGRAM TO BE GIVEN BY EAST CENTRAL JUNIOR COLLEGE

A new two-year career program in Horticulture, "Soil and Plant Technology", will be given by the East Central Junior College, beginning this fall. Although some of the classes will be held on campus, the majority of course work will be at the Garden's Arboretum and Nature Reserve in Gray Summit, Mo.

The program is designed to train people for job opportunities with greenhouses, nurseries, golf courses, landscape companies — in areas of production, processing, service and sales. Students will be able to use the greenhouses and grounds at the Arboretum for on-the-job type work, and gain valuable experience. Following completion of the program, the student will receive the Associate of Applied Science degree.

For additional information about the program, contact Mr. Robert Hood, Director of Admissions and Financial Aids, East Central Junior College, Union, Mo. 63084, or call 314—583-5193.

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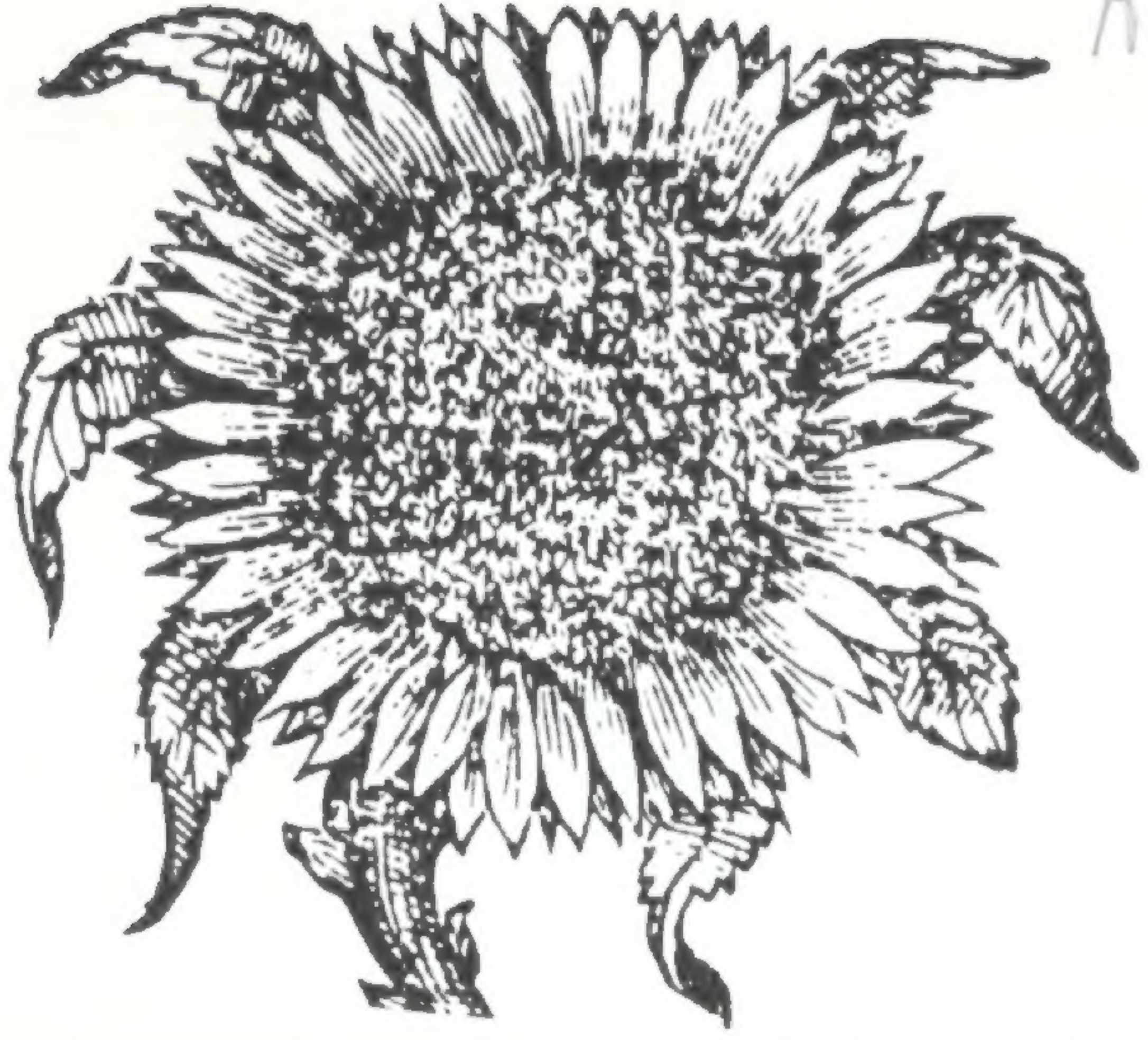
Missouri Botanical Garden Bulletin



A MASTER PLAN FOR THE GARDEN

Environmental Planning and Design, an internationally respected firm of landscape architects located in Pittsburgh, has been selected to conduct a year-long survey of the plantings and physical facilities in the Garden. On the basis of this study they will formulate a new master plan for the Garden, one that will reflect our desire to re-evaluate our role of service to the St. Louis community, the state and the nation.

EPD is uniquely qualified for this task, having studied more than 150 botanical gardens all over the world from the standpoint of their beauty and function. At present, they are engaged in a wide range of landscape architectural and planning projects in this country and abroad. These include the Chicago Botanical Garden, the New York Botanical Garden and also its recently acquired arboretum, an environmental study for the State of Virginia, and planning of new communities in Canada, Florida, Pennsylvania and the State of Washington.

Partners in the firm include John Ormsbee Simonds, Philip Douglas Simonds, Paul Dorr Wolfe, and C. Richard Hays. Geoffrey L. Rausch will be principally in charge of the field work in St. Louis, but he will consult with the partners, members, and associates of the firm in arriving at the initial plans and recommendations, which will be complete by the summer of 1973. Preliminary to the work will be the mapping of present Garden facilities and plantings, consultation and coordination with public agencies, updating of charts that illustrate the place of the Garden in the City, and a survey of pertinent ecological and environmental factors.

The resulting new master plan, the first for more than half a century, will enable us to chart the direction our efforts must take in the future, and it will also provide the specifics that will enable us to maintain the high standards that we wish to continue. During the course of the preparation of the master plan and subsequently, many local landscape architects and others will be involved in detailed planning for phases of the Garden's overall development and for particular areas. As we upgrade our plant collections and plan for future decades, it is of great importance to be able to operate within an overall framework.

Among other things, the plan will concern itself with patterns of circulation within the Garden, including the location of paths and roadways; with the location of decorative features such as fountains and walls; with patterns of topography; and, in general outline, with the arrangements and kinds of plantings for different sections. It is vital to preserve open spaces and views within a great garden, and this can be done only when an adequate plan has been prepared in advance.

The development of a master plan for the Garden is one product of the recent Capital Fund Drive. It is a necessary prerequisite for a new cycle of growth and development in the Garden, one which we hope will enable the Garden to fulfill its triple function of beauty, education, and research even better in the future.□

Volume LXI Number 2
August, 1972

GARDEN EXCHANGES "VIEWS" WITH AFS STUDENTS

Thursday, July 6, five local representatives of the American Field Service (AFS) and twenty-eight AFS foreign exchange students from fifteen countries visited Shaw's Garden. The students had recently completed their high school senior year at schools in small towns in Montana and Missouri, and, under the auspices of the American Field Service, were visiting St. Louis as an example of an American "big city."

Irene Aach was one of the University City chapter representatives of the American Field Service. She said the basic aim behind the foreign exchange student program was to enable a student to live with an American family for a year and to attend an American school in order to better understand the American way of life.

The AFS students came to the Garden late in the afternoon after visiting the downtown area. They spent the first few minutes absorbing the beautiful sight of the Climatron with the lily ponds in the foreground before moving on to the Scented Garden for the Blind. Gity Abbasi said she had not realized it possible to develop a garden that a blind person could enjoy. She thought it was the greatest idea she had ever tasted or smelled.

To Tony DeCola, a student from Italy, the most interesting aspect of Shaw's Garden was its location in the middle of the city. There are few trees in Glasco, Montana, where he attended twelfth grade, and he was certain that city residents would appreciate the respite from concrete and brick.

A number of students expressed curiosity about the Climatron, asking when it was built and by whom, what was done when the plants grew up to the ceiling, how many plants there were and where they came from. To Marta Cobos, the Climatron was a homesick sight, for the same plants are growing there that grow in her native Columbia. Another girl searched for (and found) a mango tree, just like those near her home. Many students wanted to know if the fruit on the trees could be picked and eaten; it was nearing dinnertime.

While wandering in the Climatron, two boys remarked on the turtles in the pool under the waterfall; they touched one and found to their surprise and their friends' amusement that the "turtles" were floating sponge rocks. Wolfgang Ametsbichler of Germany and Carlos Martinez of Argentina had both seen botanical gardens before. Wolfgang said the garden in Munich had a greater variety of foreign plants, but its atmosphere was more like that of a museum than our Garden. Here you can wander around and feel you are walking with nature rather than viewing the specimens of a museum. Carlos said that our Garden reminded him of the botanical garden near his home in Argentina and was the greatest thing he'd seen in St. Louis.

After a two-day stop here they visited a small town in Pennsylvania and continued on to New York City to complete their sampling of American life-styles. After returning to their homes, some will go on to college, but others will receive no credit for the year spent in schools in this country and will enroll for the senior year again at home.□

The Bulletin is published 9 issues per year, bi-monthly in January-February, March-April, May-June, and monthly from July to December, by the Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Mo. 63110. The Garden is a member of the Arts and Education Council of Greater St. Louis. Second class postage paid at St. Louis, Mo.

New Gardens at the Garden

All America Test Selections Garden

The temperature fluctuations of the St. Louis climate provide a real test for any plant. For this reason Missouri Botanical Garden was accepted as a test area by the All America Selections committee, with the expectation that our evaluation of new introductions can provide the yardstick of sturdiness that must be bred into a plant before it can withstand our arduous climate.

The Test Garden is located below the new rose garden where it will receive full sun. The evaluations below are a sample of those we have made, but we would also appreciate hearing your own analysis either of the Test Garden or of the behavior of these same plants in your own gardens.

1970

Marigold, Bolero — dwarf, larger flowers than French; petals layered and scalloped; foliage a deep green with no undesirable bluish tinges. The claim as to their uniformity is only partially true.

Snapdragon, Madame Butterfly — a new look in snapdragons; rounded rather than pointed spike — lends itself to bouquets rather than arrangements. The mixture shows a disappointing number of plants with a muddy red bloom color.

Morning Glory, Early Call Rose — very large flower at an early age; bright clear rose with unusual white throat; showing sunburn at petal edges typical of sun damage in this climate.

1971

Dianthus, Queen of Hearts — one of the best; dwarf, compact; smothered with fire-engine red blooms so that the foliage is barely visible. Now if they could only breed fragrance back into this beauty!

Zinnia, Peter Pan Pink — flowers almost as large as the tall varieties, but this plant is not over 9 inches high. P.P. Pink is an easy-to-live-with pink, but its counterpart P.P. Plum is what we call a "carrying pink".

Snapdragon, Little Darling — extremely dwarf as touted; some very good colors in the mixture, expecially the apricot.

1972

Petunia, Maxi Red, a *good* single; low compact, but spreading; almost black throat that would complement Spanish or Mediterranean architecture or decor.

Petunia, Maxi Salmon — a good pink, but not outstanding.

Petunia, Maxi Violet Blue — justifies the existence of the Maxi series; a good *carrying* blue.

Petunia, Circus Grandiflora Double — flowers very large for a double; irregular growth habit.

1973

Petunia, Telstar — a good blue-purple and white star type.

Petunia, Maxi White — a big white; flowering habit very heavy.

Petunia, Red Baron — larger than Maxi Red, without the unusual black throat. It has not been cut back to date because it is still going strong.

Petunia, Dancing Lady — an unusual burgundy and white star type. Would be a knockout mixed with a pink variety.

NOTE: At this writing John and Charlie were cutting the petunias back so they will continue flowering. They'll be in bloom again soon.

MISSOURI BOTANICAL GARDEN CALENDAR

Adult Courses — Reservations Only

September 27, October 4, Wednesdays — 1:00 to 2:30 p.m.	Drying and Preserving Plant Materials; Instructor: Mrs. E. A. Westrup, Lehmann Building; Fee, two sessions, $10.00; Garden Members, $8.00

Children's Activities

Saturday Nature Program,
10:00-11:30 a.m.
Fee: 25¢ except where
indicated by *.
John S. Lehmann Building

September 23	Table Top Greenhouses. Bring a 1-lb. coffee container and a plastic bag large enough to cover it.
September 30	*How to Make a Terrarium. Bring a wide-mouth jar or small glass bowl. (Fee: 50¢)

General Activities

August 15 9 a.m.-12 noon	Teachers Day — Education Department.
September 2-9	Cactus Show — Floral Display House
September 16-17	Midwest Regional Council of Men's Garden Clubs Fall Garden Show — Floral Display House
September 23-24	Dahlia Show — Floral Display House

Gardening in St. Louis

AUGUST

Continue drought treatment and be alert for insects and diseases. Heavy watering is needed on a regular basis.

Coldframes should be cleaned up and made ready for fall use.

Many plants can now be started from seed for use in the home greenhouse during the winter and spring. Cinerarias started in late August will give 5-6 inch pots in bloom in March. Others that need a start are stocks, snapdragons, cyclamen for Christmas in 1973, primulas and browallias.

Pansy seed sown this month may be wintered now in frames or protected beds for bloom starting next March through June. Many other perennials such as English daisies and hollyhocks, started now, will flower next summer.

Dahlias growing actively need to be well staked and dished as needed to have exhibition blooms for show in September.

Don't pinch mums back from now on or you will delay flowering till later in the fall. Feed with liquid fertilizer for good blooms.

Potted house plants plunged outside should be lifted occasionally and reset to prevent roots from growing outside the pot otherwise they will suffer severely when brought in later due to heavy loss of feeding roots. Fertilize regularly those that are growing actively.

Cuttings taken late in the month of geraniums, coleus, fuschias and others will root quickly and make good plants for winter use indoors.

Late in the month is an ideal time to start renovating the lawn. Prepare soil well by incorporating organic matter and fertilizer. Sow good seed and rake in lightly. Keep moist until well germinated.

Vegetables such as radishes, lettuce, snap beans, cabbage, and beets may be sown for a good fall crop as these do well in the cooler days.

Place orders early for fall bulbs to be assured of good quality. Perennials such as peonies and hardy lilies should also be ordered now.

Oriental poppies are best divided at this time of year and will flower normally next spring.

Continue to remove old flower heads on annuals and roses to assure continued flowering into late fall.

For an attractive carpet planting for tulip beds, sow forget-me-not (Myosotis) seed this month at a shallow depth directly in the bed that is not scheduled for lifting or replanting of bulbs this fall.□

COMPOST

Question: What's compost and where can I get some?

Answer: It is a highly concentrated form of decomposed animal and vegetable matter. You can't buy it. No one in his right mind would sell this precious stuff if he had a square foot of soil that it would benefit.

Question: Then how can I make some myself?

Answer: Books with the weight and girth of encyclopedia have been written about the lowly compost pile, each containing a different method of making compost. With full knowledge that there are many successful compost piles perking in this area, and that each was made by a different method, the following is set forth as a general method that can be adapted to various space, time, and materials available:

Experience has shown that in using both the pit and pile method the greatest amount of finished compost is achieved. Dig the pit about the size of a grave. If the neighbors ask questions, tell them that its purpose is to secure an easily accessible place for composting that is NOT accessible to their dogs or yours. Give it a wood cover with a hole that will permit a length of pipe or metal tubing to be thrust into the pit that is long enough to grasp through the cover. The purpose of the pipe is to allow air to enter the pile and heat to escape. The ingredients for the pile are:

1. animal or poultry manure – preferably fresh
2. vegetable waste, such as garbage, grass clippings or green weeds
3. water
4. activating agent
5. soil

No particular care need be taken in the order in which the ingredients are added, and the amounts need only be approximate. The amounts are usually measured by the amount of vegetable matter on hand. If the family garbage pail is emptied once a week into the pit, a like amount of fresh manure, water and soil are added. Unless you must also purchase animal manure (in the event you don't have a farmer friend who will donate it), the activating agent is the only store-bought item necessary for the pit, and this purchase is a one-time thing. Five pounds of an activating agent such as ACTIV-O is all that is necessary for a lifetime of compost. The soil bacteria contained in the ACTIV-O will continue to multiply as long as the temperature in the pile does not become too hot, too cold, or the consistency too wet or too dry.

Question: Isn't the addition of limestone necessary?

Answer: Usually enough natural lime is present in our soils. The purpose of lime is to give the pit a neutral pH and combat the high acidity of decomposition.

Question: How often must the pile be turned?

Answer: This brings us to the second step in a yearly compost program. During the summer the weekly addition to the pit makes the turning unnecessary. However, in the autumn it is time to begin the construction of the compost pile. As the leaves fall, use them to begin a pile in exactly the same manner as with the pit, using the contents of the pit as layering material between the leaves. Once again place the pipe in the center, and surround your completed compost pile with a section of snow fence or lath barrier. When this pile is finished it may tower six or seven feet high. The decomposition process will work even during winter's cold until the pile will be only about 3 feet high in spring. It is then ready to be spaded into the garden or used as a mulch.

Question: How will I know if the pile or pit is too hot?

Answer: The pipe in the center of the pile will tell you. It should be warm to the touch. If it is not, add more fresh animal or poultry manure. If it is hot, add water quickly before the high temperature kills the bacterial action.

Question: How will I know if the pile or pit is too dry or too wet?

Answer: If the pile is too dry, you will notice that the vegetable matter has failed to decompose. You will also notice a strong odor. The same is true if the compost is too wet, and you must make haste to fork it over so that air can penetrate to the soil bacteria, which are literally drowning. Compost should have the pleasant odor of a moist woodsy soil with never a hint of putrefaction. The garbage you add may have a very strong odor, but the soil you will add dilutes it immediately and the decomposition process begins.

Question: Does the compost attract animals?

Answer: If your compost pit is not covered, it will attract a few dogs during the first day or two after each addition. The pit rarely attracts mice. If this happens, however, you will also find the neighborhood cats sitting in a patient circle around the compost.

Question: Does it attract insects?

Answer: Not if a thin layer of soil is spread over it after each addition. During the summer when grass clippings are being added, care must be taken to place them in the pit in very thin layers. Grass clippings are a notorious breeding place for flies.

Question: What yield can I expect?

Answer: The average homeowner with a family of four can expect about one square yard of compost per year. It is said that one yard of this magic stuff is equal to about 3 square yards of manure or peat moss, and there is no comparison in what it can do for your garden.

Question: Are there any ingredients especially good for adding to the compost?

Answer: Some people would never think of starting a compost pile without a pair of old woolen trousers. The chemistry of this is fairly sound, but not at all necessary. Sugar in any form is especially good — such as home-canned fruits or jellies that have spoiled or molded.

Question: Are there ingredients that should be avoided?

Answer: Cigarette butts should be avoided at all times. Filter tips will not decompose, and the tobacco virus present in all cigarettes is especially harmful to tomato plants and turf grass.

Question: Can you give us any specific reasons why compost is so beneficial?

Answer: The results obtained are much too impressive to be explained by the nutrients it contains, its moisture retention, or its cation exchange capacity. There is no doubt that compost contains organisms that secrete antibiotics which protect our plants against disease. Acids formed during the decomposition process dissolve and make available some of the great store of minerals in the subsoil. But above all this, it produces plants of extraordinary vigor and productiveness. THINGS GROW IN IT!

Bloomin' Corner

. . . at the Garden

Climatron
- Heliconia (wild plantain)
- Bauhinia (white orchid tree)
- Stigmaphyllon (golden vine)

Linnaean
- Hibiscus (rose mallow)
- Lagerstroemia (crape myrtle)
- Plumbago larpentae (leadwort)
- Annuals and Perennials in variety

Pools
- Victoria reginae
- Water lilies, hardy and tropical

Be Sure To See . . .
- Rose Gardens
- Herb Garden
- Koelreuteria (goldenrain) trees
- Cool Green Vistas Everywhere

WHAT IS AN HERBARIUM?

One of the main functions of the new John S. Lehmann Building at the Missouri Botanical Garden is to house the Garden's collection of dried plant specimens. This collection, which was begun over a hundred years ago, now amounts to more than 2.2 million separate samples, each labelled and mounted. The plants have come from all over the world and have been collected during the past three centuries. The herbarium here in St. Louis is one of the five largest in the United States, the other truly large ones being at Harvard, the U.S. National Museum, the Field Museum, and the New York Botanical Garden.

When branches or, in the case of herbs, entire plants, are pressed flat and dried by heating them or by changing absorbent paper around them until all the moisture is gone, they become permanent records of the plants from which they were taken. Although the color sometimes fades, it does not if the drying is rapid enough, and some plant specimens nearly 500 years old that are preserved in Paris still retain their original flower colors. All of the structures of the plant are preserved, and the specimens can be examined and compared with other samples from other places or other seasons of the year. Herbaria exchange duplicate specimens and loan material to one another, so that a scientist who wishes to study a particular kind of plant can assemble many hundreds or thousands of specimens from throughout its area of distribution. In this way, he can see how its characteristics vary from place to place, when it blooms at a particular place, and, of particular interest, whether its characteristics have changed through time.

As a result of the spread of agriculture and cities, many places where plants formerly grew are now covered with cultivated fields and concrete. In the herbaria, or collections of dried plants, of the country, are records of their former distribution. For example, here in St. Louis we have many thousands of plant specimens brought back from the exploration of the American West, and these give us some idea of the vegetation of areas that have changed greatly during the past century. Exploration of the tropics is of vital importance at the present day, because human populations are growing so rapidly there that experts estimate that there will be no undisturbed tropical forest by the end of the present century. In other words, our opportunity to record the plants and animals of the tropics and to obtain samples for further study is much greater now than it ever will be in the future. The next 25 years are the most critical period in obtaining some record of what the tropical forest is like, and funds for exploration and the collection of plants and animals there are badly needed.

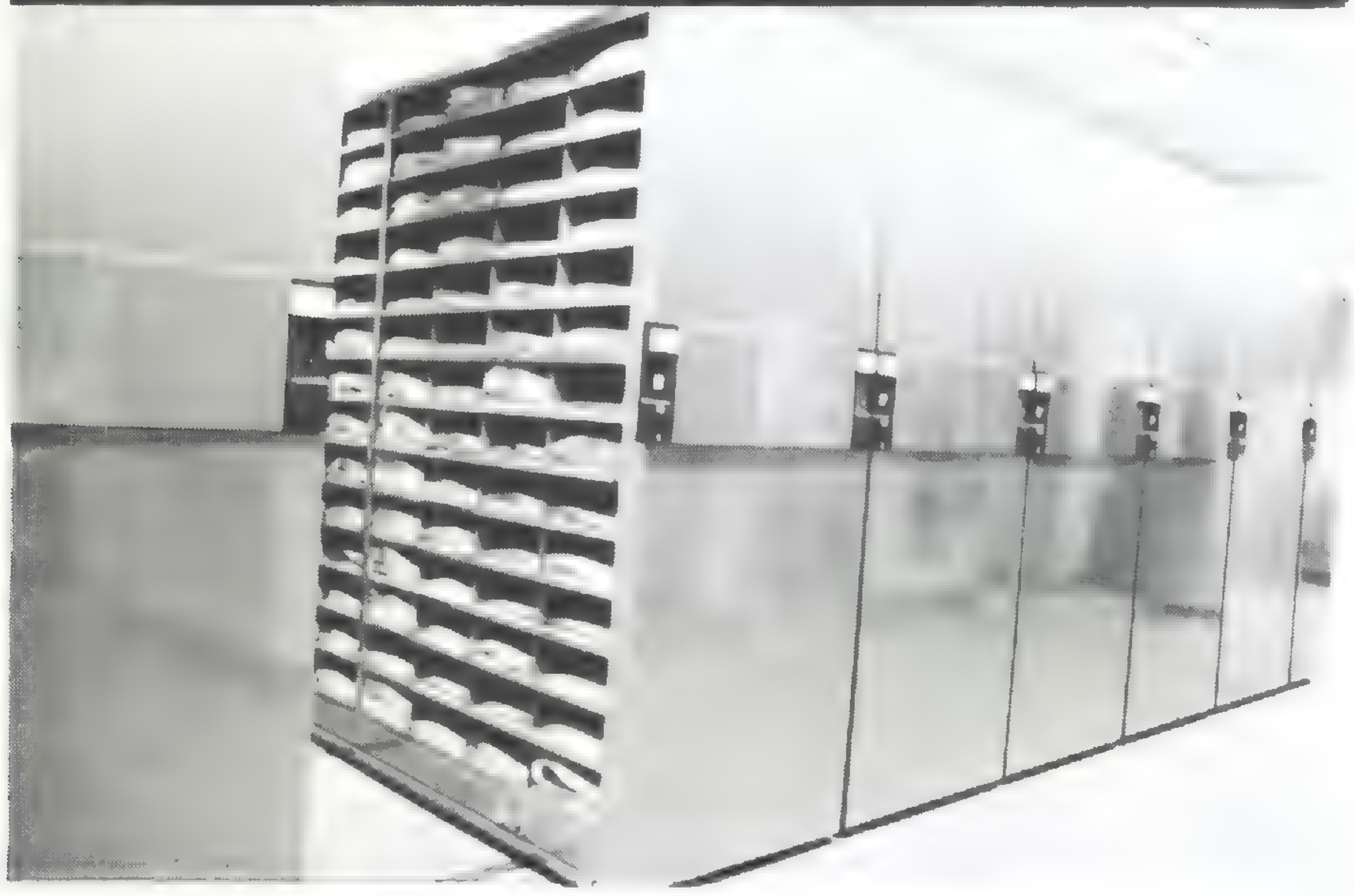
There are a number of practical reasons why such exploration is vital. First, as the tropical forests are cleared, we need some understanding of the original vegetation so as to be able to manage the fields that are opened up. Without this knowledge, the relentless action of the tropical sun and rain rapidly destroys the soil and makes any cultivation impossible. If we ever want to promote world stability, we must find some measure of stability for the so-called underdeveloped countries in the tropics. This can only be known with a vast increase in our knowledge of tropical vegetation and it is very much in the self-interest of the United States to develop such knowledge, just as it was a century ago when the exploration of the West was our prime national objective.

In addition, it is possible that the products that may be gained from undisturbed or managed tropical forest may be more valuable than the crops that can be grown on the cleared fields. Valuable timber trees, foods, and drug plants, many yet undiscovered, grow in the tropical forest, and unless the survey of these plants is completed before the forests are all cut, these products may be lost for the sake of eroding, worthless fields of low yield. The countries concerned for the most part do not have the technology to carry out these studies without the help of technologically advanced countries like the United States.

There are about a dozen institutions in the world, like the Missouri Botanical Garden, which are carrying out significant programs of exploration in the tropics. All are relatively poorly funded for this purpose, which means inevitably that while we are exploring the moon, we are losing forever the ability to know many of the kinds of plants and animals that share this planet with us. There are about 300,000 kinds of plants in the world, far too many to be grown in any one place or in all of the gardens and parks of the world put together. The only way to study them is to preserve samples or their structures, together with careful notes that are translated into labels, and to store these in the great herbaria of the world.

Here too we can trace the changes in our important crops and garden flowers that have taken place since they were first cultivated by man. An herbarium is, like a library, a vast repository of knowledge which can be used by scientists. Unlike most libraries, it contains the primary sources themselves. Scientists at the Missouri Botanical Garden, for example, are studying corn and its wild relatives, and cataloging the distribution of the various races of corn throughout the world. A detailed study of the squashes and related species is likewise underway. In improving these and other crops, it is necessary to have a thorough knowledge of their wild relatives and the races that exist at present. The same is true of drug plants and garden flowers. In the herbarium at the

George Engelmann (1809-1884), St. Louis physician, was an advisor to Henry Shaw. He launched the scientific program at the Garden. At the right, an herbarium specimen of *Engelmannia,* a Texas plant of the sunflower family that was named in his honor by Asa Gray, the great Harvard botanist, in 1840. The mounting paper measures 11½x16½ inches.



(Lower picture) One of our compactors, in which our collection of 2.25 million dried plants is stored.

Missouri Botanical Garden is a record of the plants that have been grown in the gardens of St. Louis since the late 18th century. Many varieties of plants that were grown then are no longer popular, and many garden varieties have gone out of existence. Only in the herbarium can a record of this sort be preserved.

In the Lehmann Building, the Garden's herbarium will be housed in six banks of compactors, rows of cases that are moved electrically on rails to allow access to the part of the collection one wishes to study. This modern system is used in a few herbaria in Europe and Australia, but we will now have the only large herbarium totally housed in this space-saving way. A 50% gain in available storage space in the same floor space has been made possible by these bright red compactors, built in Japan by Remington-Rand. Other large institutions in the United States, including the Smithsonian Institution and the Field Museum, will shortly be sending delegations to St. Louis to study our compactors and see how they might be used for the storage of their large collections. Tours of the building, including demonstrations of the compactors, will be available at scheduled times during the spring and summer.

The herbarium at the Missouri Botanical Garden is an important link in the world-wide system of information about plants. Citizens of St. Louis should be proud of the way in which they have augmented the original bequest of Henry Shaw in supporting the herbarium and the research associated with it throughout the years. Recently, the success of the 1969 Capital Fund Drive in raising some $3.7 million, including $600 thousand from the National Science Foundation, made the construction of the beautiful modern John S. Lehmann Building possible. The National Science Foundation on May 1 announced a further grant of approximately $668,000 for five years for the curation and operation of our herbarium. This demonstrates clearly that the herbarium of the Missouri Botanical Garden is a facility of international importance, built by the public-spirited citizens of St. Louis and now funded in part by the federal government because of the excellence that it has attained through the years.

LECTURE SERIES SCHEDULE
ONE HOUR
MISSOURI BOTANICAL GARDEN

Sept. 13	7:30 p.m.	Auditorium	Fall Gardening
Sept. 23	10:30 a.m.	Growing Center	Fall Gardening
Oct. 13	10:30 a.m.	Growing Center	House Plants and Care
Nov. 17	10:30 a.m.	Growing Center	Winter Gardening Indoors and Outdoors
Dec. 8	10:30 a.m.	Growing Center	Holiday Plants — Care and Decoration
Jan. 19	10:30 a.m.	Growing Center	Dish Gardens and Terrariums
Feb. 16	10:30 a.m.	Growing Center	Garden Design for Homeowners
Feb. 20	7:30 p.m.	Auditorium	Garden Design for Homeowners
March 10	10:00 a.m. -3:00 p.m.	Floral Display House	Homeowners Day
March 16	10:30 a.m.	Growing Center	Organic Gardening
April 13	10:30 a.m.	Growing Center	Spring Gardening

HERB SOCIETY PLANT SALE MOST SUCCESSFUL EVER HELD

The Annual Herb Sale of the St. Louis Herb Society, held in the Floral Display House on April 22, 1972, was the most successful to date. Under the expert supervision of Mrs. Frank McGuigan, chairman of the Sale, the Society's volunteers worked long and hard to propagate nearly 15,000 healthy plants of the 50 "most wanted" household and culinary herbs for the one-day event.

The purpose of the Sale, which started as a small event at the front gate, is to promote the knowledge and appreciation of herbs by making them available to the people of the St. Louis area. This year's Sale was so popular that on July 11, 1972, Mrs. George E. Penhale, president of the Herb Society at the time of the Sale, and Mrs. Robert E. Johnson, last year's treasurer, were able to present Dr. Peter H. Raven, director of the Garden, with a check for $7,400 as a contribution from the Society to the Garden derived from the proceeds of the Sale.

In accordance with the Society's wishes, these funds will be used for the greenhouse facilities at the Garden, and to make possible improvements in them not possible from the operating budget. The Society has had a long and mutually beneficial association with the Garden.

PLANT SALE

The Garden will hold a plant sale in the Floral Display House on October 7, 1972 from 9 a.m. until 3:30 p.m. The plants go quickly. Plan to come early.

SWEET HIPS

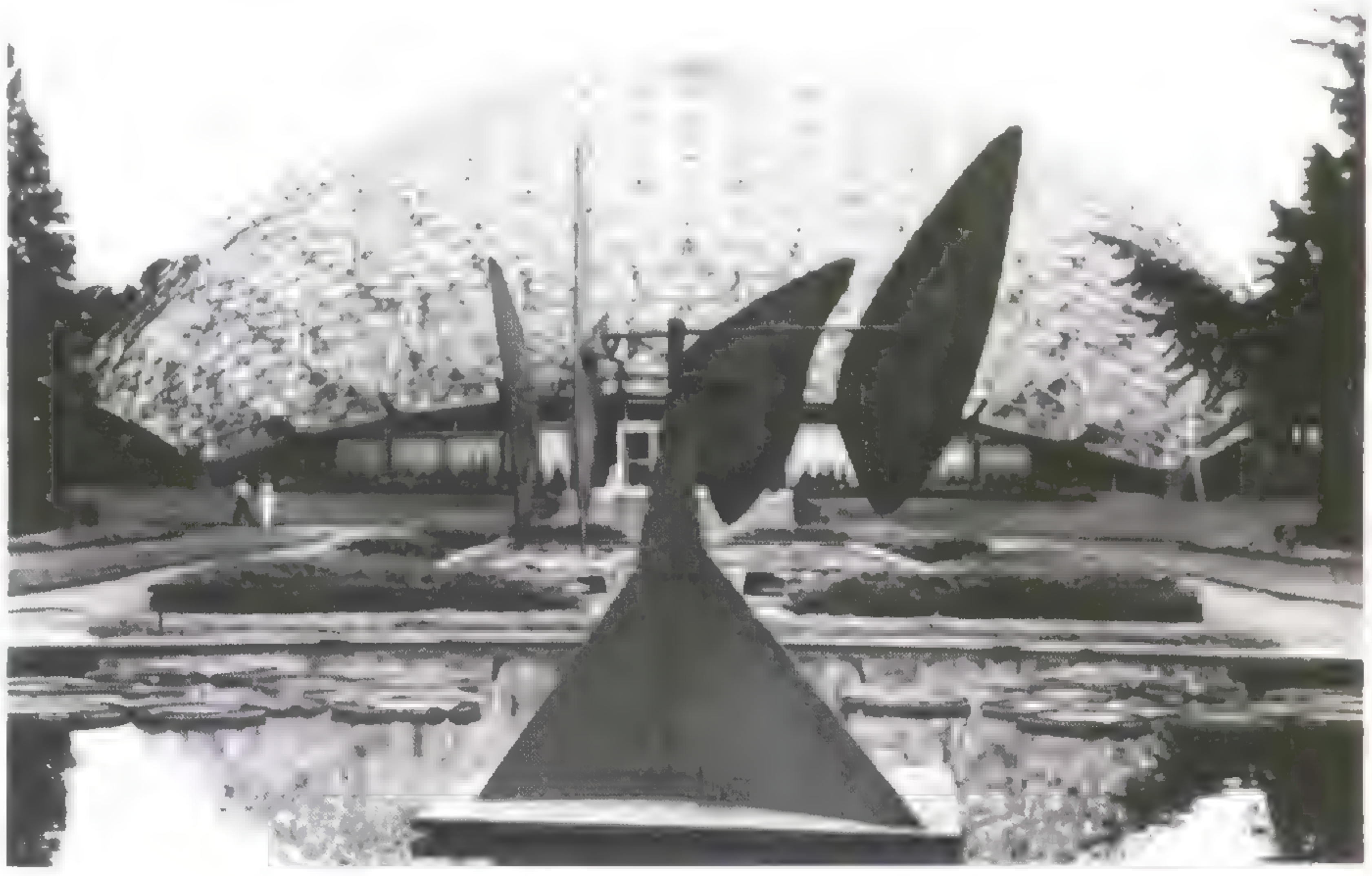
If you have the shrub rose Rosa Rugosa growing around your home, you have access to more viatmin C than all the orange juice you could drink. Tests have shown that the rose hips that appear in the early fall, after blooms have withered, are up to 60 times richer in vitamin C than oranges.

In Scandinavian countries soups and stews are made from rose hips to fortify vitamin-poor winter diets, but we can use the fruit for a more tasty and exotic treat – rose hip jelly. Of course, the jelly will taste better if you gathered the rose hips in your hat while poking through a wild thicket, and ripped your breeches in the process, but if you have plants of Hansa, Frau Dagmar Hartopp, Delicata, or Rugosa Magnifica, you'll have an abundance of hips.

Rose Hip Jelly

Remove stem ends and wash hips in cold water. Add two cups of water to each cup of rose hips, and boil 15 minutes. Mash and simmer 10 more minutes. Set the mixture aside for 24 hours in a glass or steel container. Then strain the juice through a cloth bag, squeezing the bag lightly, but not till dry or you'll cloud the jelly. To 2½ cups of juice add one cup of apple juice and 1 box of pectin. Stir to dissolve the pectin. Bring mixture to a rolling boil, then add 4½ cups of sugar. Boil for 6-7 minutes until the jelly drops from a spoon slowly in sheets. Remove from heat, skim and pour hot into sterilized jelly glasses. Cover with melted paraffin; cap, label, and store in a cool place.

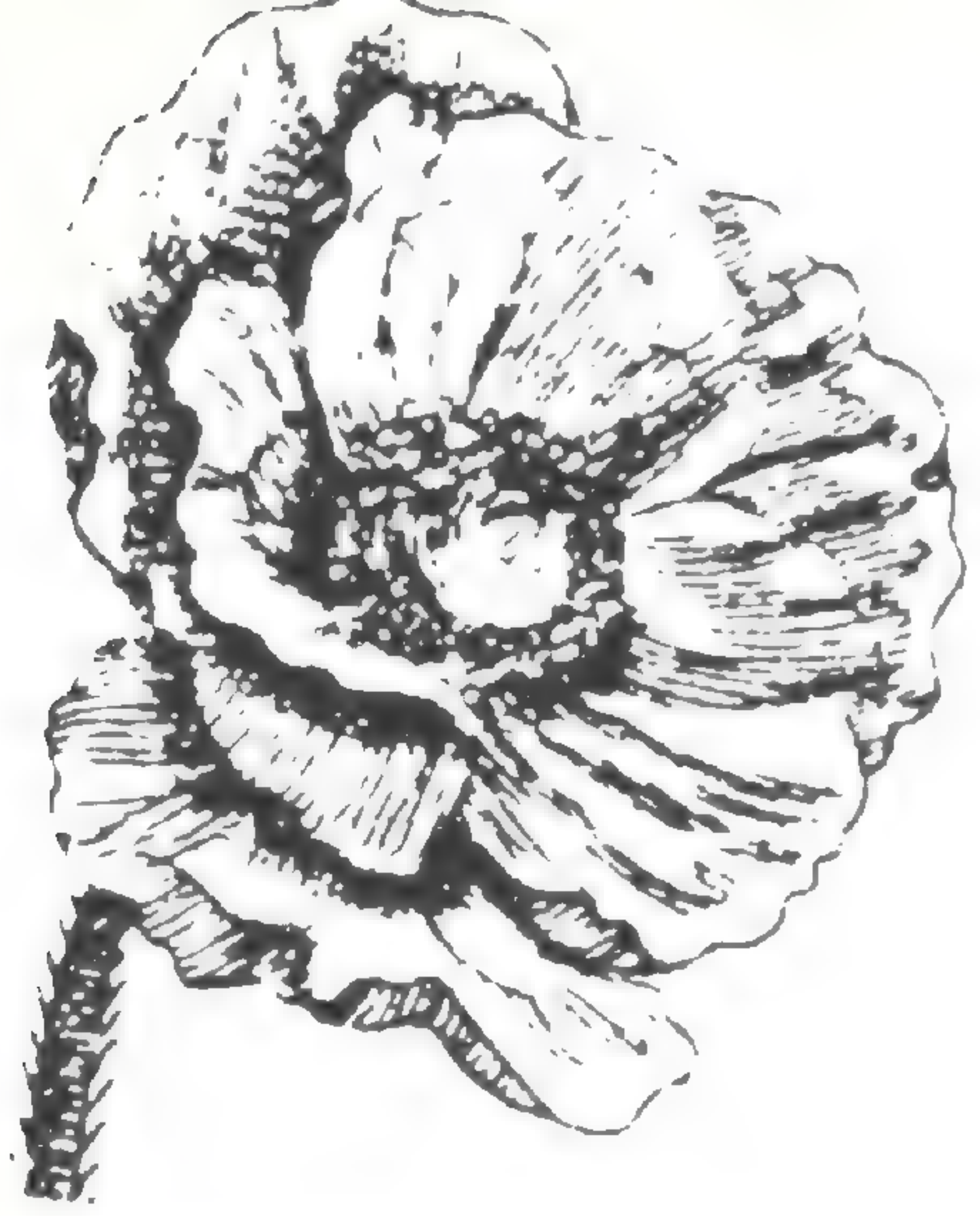
OUR GREAT GOOD LUCK



Alexander Calder's sculpture Five Rudders, a gift to Washington University Gallery of Art from Mrs. Mark C. Steinberg, is now on loan to the Garden. Placement in the center pool gives the extra quality of reflection to this magnificent piece, and the mobility of the sculpture enhances the water and adds the vertical line that has been lacking.

"The Missouri Botanical Garden is a Fund Member of the Arts and Education Council of Greater St. Louis."

Missouri Botanical Garden Bulletin



GARDEN SCIENTIST IN ANCIENT LAND TO SOLVE MODERN PROBLEM

Dr. Peter Goldblatt studying specimens of poppies which he collected on a field trip to Iran. The following is his account of the journey.

Iran, that country with such an exotic history when it was known as Persia, conjures up pictures of desert landscapes, camel caravans, oriental rugs, and exquisite mosques. This was the picture in my mind, when my wife and I left the United States in late spring on a field trip to Iran, under a grant from the United States Department of Agriculture, to conduct research on a group of poppies of importance as drug sources. This picture has been corrected and brought into sharp focus by a summer spent travelling several thousand miles throughout this country, which is about 10 times the size of Missouri.

Iran is a country of great contrasts. Much of the land is a plain at an altitude of 4,000 feet, and this area is hot and dry and extremely dusty in the summer. But Iran is also a mountain country where ranges of above 12,000 feet occur, and the highest peaks exceed 15,000. The main mountain ranges are the Alborz and the Zagroz. The Alborz rise steeply along the northern edge of the plain, and their northern slopes drop down to the Caspian Sea, which is below sea level. A crossing from the dry semi-desert through the mountains to the Caspian Sea takes one into green alpine meadows surrounded by snow-capped peaks, through lush deciduous forest, to the coastal belt which is tropical – humid and moist, and of great surprise, an area of rice and tea cultivation.

I was to learn a lot more about these mountains, for I soon discovered that the poppies I was searching for only grew above 6,000 feet. Because of the height and ruggedness of the Alborz, there are few roads traversing them, but these roads, which carry large volumes of traffic, offer superb mountain scenery.

The population of Iran is about 30,000,000, not low; but unlike the United States, humanity is not obvious. Outside the cities, the populace lives in small mud villages in tiny houses clustered together, leaving the surrounding land clear for agriculture or grazing. Upon entering a town or village, I was always astounded by the large number of people living there, and especially when visiting the market or bazaar where people jostle shoulder to shoulder.

Our research team consisted of two Iranian chemists and several laboratory technicians who usually remained in Tehran at their laboratory while my wife, Margaret, and I spent as much time as possible in the field. Fortunately we were given a driver who, though he spoke little English, knew enough to serve as interpreter and to communicate our needs to the villagers and shepherds.

Our usual method of work was to drive into the mountains and stop at a village near where we believed the poppies could be found, and then wave a portion of the plant we wanted at the villagers who, after hustling their women out of sight, would gravely concentrate on our problem. The people knew their surrounding flora very well – they could often take us to places where poppies grew which we could never have found without their guidance. Sometimes,

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walking to these places was impossible and donkeys were summoned. After half an hour of tea drinking in the local tea shop, two or three tired looking animals would appear.

A donkey ride may sound pleasant in terms of an hour trot around a field, but for five or six hours up and down 3,000 feet it is not only unpleasant, but painful. The ride is not made any easier by the type of saddle used, which consists of quantities of cloth and carpeting and an extremely hard wooden seat. The bundles of cloth made the seat very wide and this would force my legs out at a right angle from the animal. As there are no stirrups or reins, the effect is that no move the animal makes is cushioned or insulated, and the whole undertaking becomes a form of torture.

In spite of the rugged conditions in the mountains and the difficulties of access to places where the poppies could be found, my wife and I came to appreciate the mountains for the delicious cool climate they offered after the 100 degree heat of Tehran or the other inland cities, or the intolerable humidity of the Caspian coast in a country where air conditioning is rare.

Why you may wonder, and in what cause was I so diligently looking for poppies. The answer is to be found in a very modern problem — drug abuse. Poppies are members of the plant genus *Papaver,* long known to contain chemical substances of considerable medicinal value. The milky juice, or latex, which is so characteristic of poppies and which spills from broken or cut parts of the plant is rich in these substances which belong to a class of compounds called alkaloids. These are extremely bitter and make most poppies quite unpalatable. This is fortunate because many alkaloids are poisonous to both grazing animals and to humans. However, when used in judicious quantities, they may be valuable medicines or drugs.

The best known alkaloids obtained from poppies are those from *Papaver somniferum,* a species named for its sleep inducing properties. Its alkaloid extract which is known as opium contains quantities of codeine, a well known pain killer, and morphine, a once valuable drug which is unfortunately addictive, and as a result its use is not encouraged today. Heroin is produced from morphine by a simple chemical reaction.

As a result of the increasing narcotic drug problem in the United States and elsewhere in the world, steps are now being taken by the United States Government and the United Nations to cut off the supply of heroin at its source by curbing the cultivation of *P. somniferum* and consequently to stop the production of opium. *P. somniferum* is unfortunately a very easy plant to grow under all kinds of environmental conditions and it is illegally cultivated in several inaccessible parts of the world, such as central Turkey, Afghanistan, and Laos. Most of the opium harvest from these areas is smuggled into the U.S. and sold to drug addicts.

The problem has reached such proportions that the United States Government through the agency of the U.S. Department of Agriculture, is actively encouraging poppy farmers to cease growing this plant. To avoid unnecessary hardship to farmers who have grown this crop for generations, and whose livelihood depends on it, much is being done to educate farmers by encouraging the use of alternative crops.

Some people see the problem as such a serious one that they even suggest banning the cultivation of *P. somniferum* throughout the world, even where it is safely grown under governmental licenses. An alternative approach to the drug addiction problem is to find products which replace the heroin that the addict requires in increasing doses and withdrawal of which is so painful and distressing. The theory behind this idea is that a chemical, perhaps an alkaloid, might be found which the body accepts as a replacement for heroin, but which did not have the same harmful and debilitating effect on the human system. Not only might addiction of this kind be harmless, but withdrawal may prove easier. One drug of this type is methadone, a synthetic narcotic which has many similarities to morphine, but this is not proving as satisfactory as had been hoped initially. Meanwhile, the search for other drugs of a similar nature is being intensified and alkaloids from other species of *Papaver* are among those substances most promising of a good result.

The most promising species in the genus from the alkaloid aspect, belong to the section *Oxytona,* which includes the cultivated oriental poppy, *P. orientale, P. bracteatum* and several other little known species all of which grow in Iran, Turkey, and southern Russia. As a whole, this section of the genus is not very well known scientifically. The United States Department of Agriculture, in order to learn more about the alkaloids in the group, awarded the Missouri Botanical Garden a grant to study the botanical aspects of the problem. Researchers in Turkey and Iran were also contracted to investigate aspects of this group of poppies and an intensive study project has been mounted involving field trips to Iran and Turkey for the collection of numerous botanical specimens and samples for alkaloid analysis. One of the most promising alkaloids, thebaine, is found in *P. somniferum* in small quantities, but is also known in other species,

The Bulletin is published 9 issues per year, bi-monthly in January-February, March-April, May-June, and monthly from July to December, by the Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Mo. 63110. Second class postage paid at St. Louis, Mo.

especially *P. bracteatum.* Another even more valuable property of thebaine is that it can easily be converted into codeine which is still such a valuable medicinal drug. This fact holds tremendous economic importance if the growing of *P. somniferum* is banned throughout the world, as codeine is not known to appear in other plants and cannot as yet be artificially synthesized.

My own position on the project is to coordinate work done in Iran and Turkey, and to undertake the botanical study. Since the project began in May of this year I have spent over two months in Iran where *P. bracteatum* and *P. orientale* and their close relatives occur over a wide area of the mountains of the northern and northwestern parts of the country. Although it is too early to draw conclusions from observations made during the expedition to Iran, it is clear that the decision of the USDA to mount a botanical study together with alkaloid investigation is fully justified.

Information not previously known on the ecology and habitats of the poppies has at last been investigated and recorded. This type of information will be essential if and when the need arises for full scale cultivation and cropping of any of the species of *Papaver* found to contain valuable drugs. One of the problems with any of the *Oxytona* group of poppies found in Iran is that all wild plants grow in mountain areas above 6,000 feet. It is well known that these same species will grow at lower altitudes, as they are sometimes grown in gardens. What is not established yet however, is whether the kinds of alkaloids will remain constant with such radically different cultural conditions. If the alkaloids do differ it will become necessary to find similar environments somewhere in the United States where the growth conditions will be exactly duplicated.

Field studies of the living poppies have also yielded valuable data on the nature of the species of *Papaver* in the section. All previous studies of the genus have been based on dried specimens only and these are frequently difficult to understand. Live studies show promise of a greater understanding of the plants and will yield a better classification of the complex as a whole.

The Missouri Botanical Garden is ideally suited to pursue the botanical studies of *Papaver* once materials have been collected in the East. With the laboratory facilities and the green houses available, cultivation, breeding and microscopic study will be easily accomplished. It is hoped that after another field trip to Iran and to Turkey the botanical problems of *P. bracteatum, P. orientale,* and the related species will be better understood and that the Missouri Botanical Garden will be able to make a valuable contribution to solving the drug problems of the world. □

AN ONGOING REPORT

Almost a year ago, birds and animals were brought to the Climatron by the St. Louis Zoo; first the iguanas, then, somewhat later, the spoonbills, red headed pochard ducks, Lady Amherst pheasants, a toucan and, in May, hummingbirds. Easy adaptability to our tropical greenhouse has been, and continues to be, the determining factor in the choice of wild life. We have been reasonably successful; even the shy hummingbirds, rarely seen by the public, are alive and very active.

Our most recent addition, on August 4, was the Zebra Butterfly *(Heliconius charitonia)*, a handsome black and yellow striped species which occurs widely throughout the tropics of North and South America, just reaching the United States in southern Texas and Florida. Caterpillars of the species feed on various kinds of passion vine, of which there are eight in the Climatron, including the beautiful Brazilian *Passiflora caerulea* on the trellis of the north patio. All of the caterpillars and adult butterflies introduced were descended from a single female butterfly caught by Dr. Lawrence T. Gilbert of the University of Texas, and sent by him to the Garden.

The six adult butterflies and nine caterpillars released in early August did not survive. All we can say positively is that they did not become acclimated to the environment here. On another try, we would confine the butterflies to a controlled area until they recover from their trip from Texas.

The beauty and surprises that moving life add to the time a visitor spends in the tropical atmosphere of the Climatron become richer on reflection, and so one can easily imagine the contribution butterflies would make. If we finally succeed in getting the Zebra Butterfly established, then other colorful species will be introduced from time to time. □

Gardening in St. Louis

September brings the beginning of fall and cooler weather. The pattern of gardening should now change to one of active cleanup, renovation and replanting. This is also the time to make notes of successes and failures and to jot down reminders for future years.

Fall is the best time to renovate an old lawn and plant a new one. Read further for information and be sure seed is fresh and of good quality. Water lawns as needed, and fertilize present lawns now to encourage good growth. Continue to watch for insect damage (leaves being eaten or brown spots in the lawn) and control as needed. Be careful choosing insecticides, as many of the newer ones are as harmful as the old ones. Some safe insecticides are: pyrethrum, rotenone, diazinone and malathione (with extreme care).

Most perennials are best redivided and reset now, with the exception of late fall flowering ones, which should be left until spring. Add plenty of organic matter, such as compost, animal manure or peat moss to the soil with bonemeal and work in well. Mulch new plants well with compost, leafmold or wood chips, as this will keep soil cool and moist, allowing plants to make good growth.

Spring flowering bulbs will be on sale now, so select as early as possible and store in a cool, dry area until they can be planted. Daffodils should be planted in the ground now, while tulips can wait until October.

This is a good time to start a compost pile, using the weeds and other debris from the garden. Later you can add the leaves. Be sure to keep the pile wet and add some old compost to the pile to introduce the bacteria needed to break the new material down.

House plants set out for the summer should be cleaned up and gradually moved indoors as the month advances. If insects are present, spray the plants and check to see if plants are root-bound. Repot as necessary and prune back to control shape and size. Cuttings of geraniums, coleus, begonias and others made now will make ideal plants for indoors.

Evergreens may be planted now. Dig the hole twice the size of the root ball and replace the soil with one containing equal parts of organic matter. Water and mulch well. Clean up weeds around other shrubs and evergreens and add fresh mulch.

Pruning of late summer blooming shrubs should be completed this month. In pruning, cut the plant back to control the height and also to remove some of the heavier stalks at ground level, plus any weak shoots so as to allow air circulation. Also prune any broken limbs or branches damaged in the recent storms.

Do not fertilize roses, shrubs and trees now, as this will not allow these plants to harden off for the winter ahead. Root feeding of these may be done once they are dormant, in early November.

Purchase ferns and house plants now so that they may become accustomed to house conditions before winter sets in. See you at the Garden's annual Plant Sale on October 7.

Clean up cold frames now, removing any unwanted plants and weeds, and prepare the soil by adding organic matter. Lettuce, spinach and radishes may be started now for late fall use.

For those attempting to flower Poinsettias for Christmas, plants should be given lots of light during the day, but placed in the dark from 7 p.m. until 7 a.m., otherwise they will fail to bloom. □

TURF TIPS

It's not too late for making a new lawn or repairing an old one. Before you consider soil preparation, take time to make plans for watering your lawn. An underground sprinkler system is fine, but a simple arrangement of hose lines and sprinklers will be adequate. The big thing is to overlap the sprinkler pattern so that every square inch is covered. You may think you will be faithful in walking around a new lawn with a hose, but when faced with this dismal daily prospect, you may wish you had made other arrangements before the lawn was planted. Remember that allowing the seed to dry just once means a total loss.

Soil preparation for a lawn is basic and begins with pH, a term for acidity or alkalinity. In this area we rely on spot soil tests to determine acidity or alkalinity, for no blanket statement can be made. A soil sample can be sent to Univ. of Mo. Extension Division at 230 S. Meramec, 63105. The charge is $1.50. Generally speaking, the pH of the soil in this area is nearly neutral (7.0), but pockets of both acidity and alkalinity are common, and an ideal pH for lawn is 6.5. If the pH is less than 6.5, fifty pounds of ground limestone to 1,000 square feet should raise the pH one unit. Ordinarily, liming is not needed more than once every four or five years. Successive small additions, until the correct pH is reached, are preferable to a single large application that might cause temporary soil "indigestion."

Ground corncobs and sulphur are the ages-old combatants against alkalinity (a pH of 7.5 or above), and they still make good sense IF the ground corncobs are applied to a depth of three inches; IF the sulphur is applied in the form of ammonium sulfate at a rate of one cupful to each bushel of ground corncobs; and IF the whole caboodle is stirred up with a rotary tiller with the tines set at eight inches.

The three major elements needed by any plant are nitrogen, phosphorous, and potassium. In turf management the importance of incorporating phosphorous in the soil before planting cannot be overemphasized. This is the only opportunity you will have to apply this mineral to the root zone, for it moves very slowly in the soil. Old-fashioned superphosphate is still one of the best, applied at 20 pounds per 1000 square feet. If the general fertility of the soil is low, you may want to apply a fertilizer that contains all three of the major elements. The guesswork has been taken out of this operation by the manufacturer's label, which will tell you the amount to apply to the number of square feet of surface, and at the correct setting of the spreader device. Bonemeal is good, but it promotes a fine hair-like growth that is more susceptible to disease.

The next step is the incorporation of organic matter (OM to the agronomist). The choice is wide: ground corncobs, peatmoss, coarse sawdust — any of these will do the job, but compost is best if you have it. (See Aug., 1972 Bulletin). Animal manure for the lawn is regarded as "nothing short of barbarous" by leading turfgrass specialists, but the animal manures incorporated into compost are virtually weed-free because the heat of decomposition process has killed them.

Grading is a tiresome business, but every bump and depression removed before seeding means less trouble later on. Use a rake for grading small areas, and finish up with a homemade tool made of a six foot length of rough lumber 2x4 with a rope handle if you are averse to the noise and general fuss of motorized equipment. When grading is finished, the seedbed must be firm, and the surface should contain grains of soil about the size of rice. If it is worked into a finer condition, it tends to pack and cake to the consistency of concrete. Leave a gradual slope along walks and drives so that water will drain from these areas. Remember that a flat, grassy surface will not drain and presents a dull, uninteresting picture.

Selection of seed for a lawn for this area presents a wide spectrum. New varieties of Kentucky Bluegrass appear each year. You can't try them all, and neither can we (until our new turf trials are set up next year, that is), but the Garden has been very satisfied with the performance of Fylking. Seed mixtures are no longer fashionable because a stand of a single species gives a more uniform appearance in color and texture. Make your choice of any of the Kentucky Blues, but avoid bargain offers. Cheap seed mixtures contain a high percentage of pasture and "hay" grasses, plus clover, which is no longer considered necessary as a nurse plant.

The last step before sowing is to place the seed in a paper bag containing the prescribed amount of turf fungicide containing maneb. A few shakes of the bag will give each seed a protective coating that might mean as much as a 30% better stand of grass.

Sowing: By all means use a mechanical seeder. Even distribution by hand is impossible. When sowing is finished, the seed will be easily seen on the soil surface. That's fine! Leave it there. Do not "rake in lightly." Research has proved that bluegrass seeds must have light in order to germinate. Roll the soil surface so that each seed makes good contact with the soil. A very light mulch OF DRIED GRASS CLIPPINGS OR MILLED sphagnum moss is permissible to preserve moisture, but the hot, bright sun of autumn days and sharp temperature drop at night provide the power punch the seed must have to "git-up-and-go."

There are only two times in your lawn's life that it should be mowed short (one-half inch), and both of these occur during its babyhood. When the seedlings reach more than one-half inch in length, no matter how sparse and thin they seem to be, allow the lawn to dry out for half a day before mowing. This gives the latecomer seeds a chance for air and light. Also, the mowing forces each seedling to produce a crown that will throw out root runners (termed stooling-out). Continue to keep the young lawn mowed to a height of two inches until winter weather stops top growth. This is not intended to be the final height. This is determined in spring, according to the variety of bluegrass planted.

Lawn making is not nearly as fascinating as puttering among the roses and iris, yet these would look bleak and desolate without the lush green lawn around them. Neither you nor your choice plants would be as healthy with the lawn, for these thousands of tiny grass plants temper the wind and temperature fluctuations as well as provide a fresh supply of oxygen for all life around them. The lawn is truly a canvas upon which the landscape picture is painted. □

PLANT SALE
TO BENEFIT GREENHOUSE RENOVATION

Saturday, October 7 9:00 a.m. to 3:00 p.m.
Floral Display House Shaw's Garden
Tropicals and semi-tropicals
Suitable for home and office

A MONUMENTAL MOVE

When the excitement of the completion of the John S. Lehmann Building, the formal dedication ceremonies, the special tours for the Membership and Architects' Sunday on which all that lovely, empty space was on display, had died down, the last phase of establishing the Library/Herbarium-Education Complex had to be faced. Moving in.

Dr. Marshall Crosby, Curator of the Herbarium, and Miss Eugenia Maddox, recently retired Head Librarian, had been thinking of moving 2,200,000 herbarium sheets and 70,000 books for quite some time. They had worked closely as construction progressed, defining problems and establishing priorities.

Most of the herbarium sheets were stored on the second and third floor of the old building which has twelve-foot ceilings and an elevator with a very small capacity. Herbarium sheets are not filed alphabetically, nor by numerical coding such as the Dewey Decimal system. They are grouped by plant family, then subdivided according to genera, and then divided again into species.

Allotting the space in the new compactors for the 230 plant families required much advance planning: there were 18,000 pigeon hole spaces in the old facility and 47,000 in the new. This meant that for each plant family, there would be 2½ times the amount of space which could be used for expansion and new acquisitions. Herbarium Supervisor Sheri Davis drew a map of the aisles and each face of each compactor, and from this the new locations were determined.

Moving the specimens had a distinct advantage, since each of the sheets is the same size. 11,000 boxes, each containing 200 sheets, were packed and labelled, then carried to nearby windows and moved to the ground on a conveyor belt. The Garden's Cushman scooters, usually in service moving bales of peat, plant material or nursery stock, were loaded and moved the boxes the short distance to the Lehmann Building, where another conveyor belt moved them down the steps to the compactors.

The move was smooth, the weather was good during the entire operation, and Jim Hampton's staff kept the machinery, as well as the planning dictum, well-oiled.

Advance planning for the library move was complicated by the fact that there was no way to determine the exact shelf space necessary to house the entire collection. Boxes and boxes of books were stored in the old building; none had been catalogued, and none had ever been shelved. 7,000 boxes of books were packed and moved to the new building in a two week span, but the problem of shelving them remains. There is ample room at present, and the library should never again face overcrowding, for the

FROM THE OLD ....

TO THE NEW

design of the building allows for another module to be added when necessary.

Unlike the Herbarium, each book must be handled separately — dusted, checked for loose pages, pamphlets, or manuscripts, and numbers put on the spines. It will be several months before that operation is completed.

The new Head Librarian, James Reed, is a native of Durango, Colorado, but came to the Garden from Michigan, where he gained experience moving the University of Michigan Public Health Library just before coming to St. Louis. He and his staff are always available to assist researchers.

The question is often asked by Members of the Garden, "Can we use the Library?" Reed answers, "Yes, and welcome!" But he asks that you wait until the announcement that the move is complete. Mr. Reed will also be inviting Members to use the reading rooms to study monthly journals and magazines. For botanists, horticulturists, and gardeners this will solve the problems of choosing publications, finding a quiet place to read them, and (worst of all) storing back issues. □

FOR SALE
USED HERBARIUM CASES
$30.00 each, in units of 2, 4, 6, or more. Contact Dr. Crosby or his staff for further information.

ARBORETUM DESIGNATED NATIONAL LANDMARK

On July 14, 1972 Secretary of the Interior Rogers C. B. Morton announced that the Arboretum and Nature Reserve of the Missouri Botanical Garden, located at Gray Summit, had been designated a National Environmental Education Landmark (NEEL). This brings to 16 the number of such sites which have been recognized as notable outdoor classrooms. The designation of such sites is a project of the National Park Service which serves to assist American education in stimulating environmental learning. The purpose of designating such sites, according to Secretary Morton, is to "encourage the use of outstanding locations — in cooperation with non-Federal organizations — to teach the relationship between man and his environment, an objective set for us by President Nixon." The Arboretum, an area of 2,200 acres, is located about 35 miles southwest of St. Louis. Education programs are offered year round to students and the general public. Ceremonies recognizing this new status are to be held at the Arboretum late in October. □

Left to right — Jack Wheat, Asst. Superintendent, Jefferson National Expansion Memorial; Ivan D. Parker, Superintendent, Jefferson National Expansion Memorial; Dr. Peter H. Raven, Director, Missouri Botanical Garden.

N P S PRESENTS GIFT TO GARDEN

On August 3, 1972 Ivan D. Parker, Superintendent of the Jefferson National Expansion Memorial, presented a check for $5,000 to Dr. Peter H. Raven, Director of the Missouri Botanical Garden, in honor of the 100th Anniversary of the National Park System. The National Park Service and the Missouri Botanical Garden have engaged in cooperative educational programs since the summer of 1970. A summer adventure program, sponsored by the National Park Service, has made it possible for children from the city schools to hike, wade in rivers, and study the wonders of a natural ecosystem. Approximately 1,500 children have been able to participate in this program each summer which employs the facilities and Garden staff of the Aboretum located at Gray Summit.

The check was given to enable the Garden to continue to support programs in environmental education and the funds will be used primarily to maintain and upgrade facilities at the Arboretum. □

TOWER GROVE HOUSE INCLUDED IN LANDMARKS "HISTORIC PRESERVATION WEEK"

Tower Grove House, the country home of Henry Shaw which was built in 1849, is included in "Historic Preservation Week Tour," October 14 through 22. The Week highlights twenty-five important historic sites in the greater St. Louis area.

Tickets admitting the holder to each of the sites are $5 for adults; $3 for children. The ticket includes admission to the Missouri Botanical Garden, as well as Tower Grove House. They are for sale at the Garden Gate Shop, and at the House. □

OCTOBER CALENDAR OF EVENTS

Special Events

October 7	Plant Sale — Floral Display House, Growing Center, Head House 9:00 a.m. to 3:00 p.m.
October 13	Lecture Series — Growing Center 10:30 a.m. — "House Plants and Their Care"
October 20	Chrysanthemum Preview Party Members and Their Guests Floral Display House — 5:30 - 7:30 p.m.
October 21 through November 26	Chrysanthemum Show Floral Display House

Adult Classes

(Reservations Only)

	Plant Propagation from Cuttings Instructors: Clarence Barbre and Kenneth Peck — Fee: $16.50, for Members $12.00
October 2, 9 16, 23, 30	Section A — 1:00 - 2:30 p.m. (Mondays)
October 5, 12 19, 26 and November 2	Section B — 10:00 - 11:30 a.m. (Thursdays)

Children's Classes

Saturday Nature Study

October 7	"The Forests of the Rocky Mountains" 10:00 - 11:30 a.m. — $.25
October 14	"Pond Walk" 10:00 - 11:30 a.m. — $.25
October 21	"Planting Bulbs" (Bring 1 lb. coffee container) 10:00 - 11:30 a.m. — $.50
October 28	"Planting Baby Christmas Trees" (Bring 1 lb. coffee container) 10:00 - 11:30 a.m. — $.50

NEW LIFE MEMBERS

The Garden is grateful to the following new Life Members.

Dr. and Mrs. Herbert F. Kalbfleisch
Miss Nina K. Bernd
Mrs. Owen J. Sullivan

Their gifts to the endowment demonstrate faith in the continued growth of the Missouri Botanical Garden. ☐

SPECIAL SALE
SHAW HOUSE COOKBOOK

The "Shaw House Cookbook" is a collection of 250 "choice recipes" plus 14 menus and assorted household hints — from the elegant age of Henry Shaw and Tower Grove House — revised for modern living.

Now is the perfect time to order one, in time for some old fashioned holiday cooking. Better still, give a Shaw House Cookbook as a gift, along with a delicacy made from one of the recipes.

The books may be purchased at Tower Grove House, or the Garden Gate Shop, at $3.00 each; mail orders, $3.70 each. To order, write Tower Grove House, 2315 Tower Grove Avenue, St. Louis, Missouri 63110.

On November 10th and 11th, special mother-daughter teams of the Historical Committee will appear in all Schnuck's Supermarkets — daughter will offer sample cookies made from one of the recipes, and mother will handle the sales. ☐

Bloomin' Corner

OUTDOORS

- Roses
- Water lilies
- Zinnia linearis

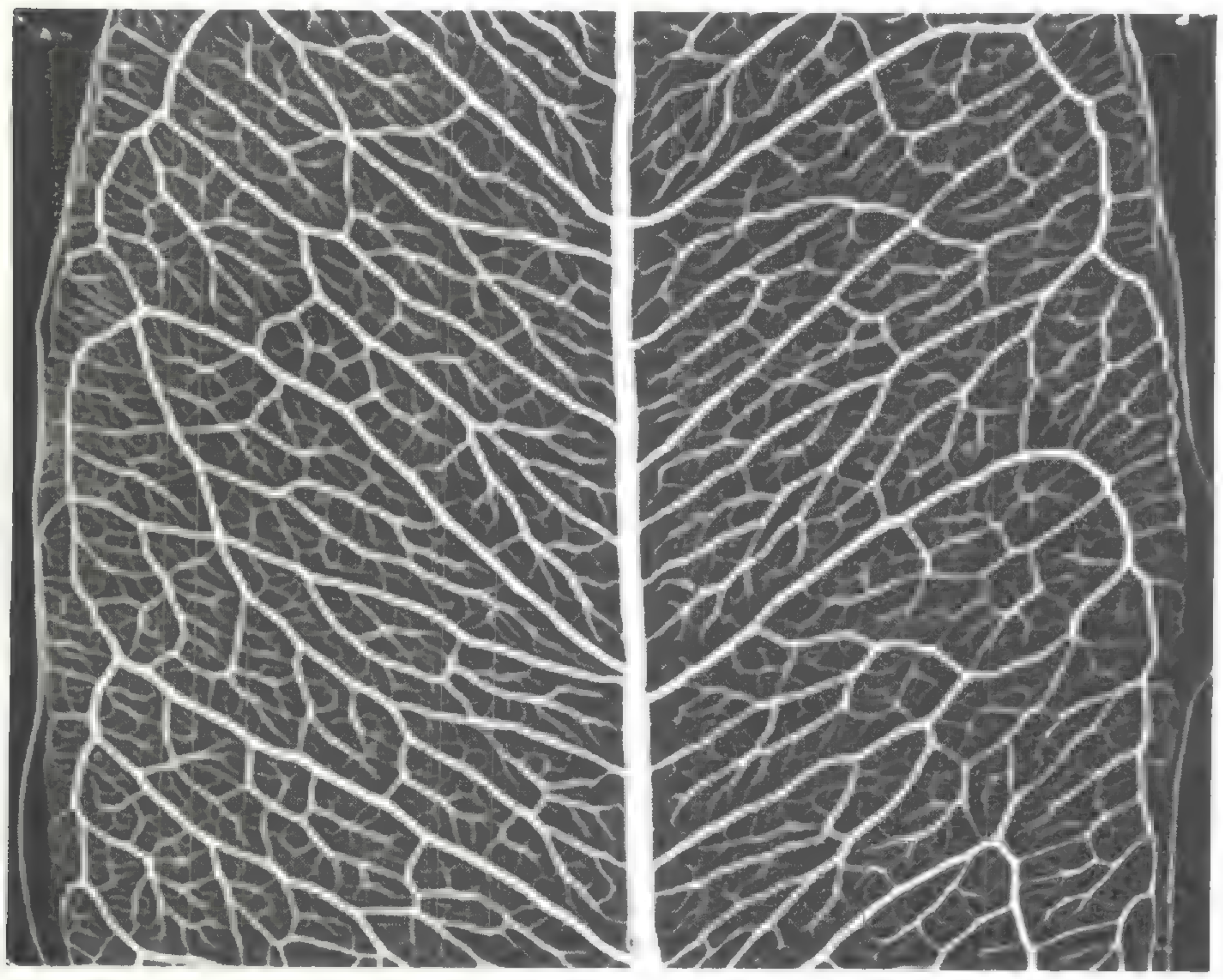
INDOORS

- Anthuriums
- Hibiscus
- Spathiphyllums
- Costus species
- Loquat
- Orchids

"The Missouri Botanical Garden is a Fund Member of the Arts and Education Council of Greater St. Louis."

Missouri Botanical Garden Bulletin

LEAF SKELETONS HOLD CLUES TO PREHISTORIC TIMES



A paleobotanist with the United States Geological Survey at Menlo Park, California, Dr. Jack A. Wolfe, has been doing unusual work at the Garden's herbarium. His area of concern is the identification of fossil leaves, particularly those of flowering plants covering the last 120,000,000 years of geologic time. By proper identification, it is possible to date various geologic formations accurately, allowing geologists to interpret fossil environments which occurred at various times at various places on the earth's surface.

Traditionally, paleobotanists have relied upon specimens in herbaria to provide clues in establishing relationships between modern and fossil plants. The "old-fashioned" method consisted of searching through the herbarium to find a leaf that resembled a fossil form. The assumption was that if these parts were similar, the plants were closely related. Dr. Wolfe points out that such assumptions were often unwarranted, and even led to rather ridiculous conclusions. In one instance, a reptilian jaw bone was misclassified as a cocoa bean pod!

The new method attempts to find ways of correlating the evolutionary rates of different parts of plants, to understand changes in flower and fruit characteristics, upon which so much weight is placed in classification, with characteristics such as the pattern of veination in leaves. This procedure requires a large reference collection of "cleared leaves." Leaves are bleached and stained so that the specimen looks like a "leaf skeleton." The U.S. Geological Survey is building such a collection, and at present has 4,000 specimens, the largest of its kind in the world.

Dr. Wolfe stated "We do know from the record of fossil fruits and seeds, which are more reliable right now than those of leaves, at 50,000,000 or more years ago, that we are dealing with a large number of totally extinct genera. Many of these even in the Northern Hemisphere turn out to be related, based on fruits and seeds, to modern African genera. These presumably have become extinct in the Northern Hemisphere tropics." To correlate these fossils with modern African plants, Dr. Wolfe came to the Missouri Botanical Garden because its herbarium is the only one in the United States with a broadly based African collection covering a wide geographic area and all groups of flowering plants.

The Missouri Botanical Garden is currently involved in supporting many projects such as this. ☐

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AFRICAN FLORA AT THE GARDEN

The acquisition of African plant specimens has in a very moderate and undirected way been going on at the Garden for many years — in fact, almost as long as the herbarium has been in existence. Only recently has the value of an African collection been appreciated and has a positive effort been made to encourage studies of African plants, and to acquire quantities of African specimens.

As science became international, scientists began to travel widely. Many American biologists visited and studied in Africa in search of valuable medicinal plants, new crop plants, or wild ancestors of present day crops. Though individual research of African flora increased steadily, there was no recognized center for the study of African Flora in the New World. The need for such a center was brought into focus in 1968. Several of the larger United States herbaria were considered in this respect, but few had ever had any connection with research on African plants. The Missouri Botanical Garden, with an old and valuable collection to which additions had been made for many years, took on responsibility for the program. Consequently, it has become officially recognized as the major repository for African plants in North America.

Since 1968 the program to acquire African material has been given a priority and with limited resources the herbarium began to exchange or receive gifts of African plants. A project initiated in the 1950's, in cooperation with the Royal Botanic Garden at Kew, England, has produced unusual dividends. A group of botanists from the Missouri Botanical Garden photographed valuable type specimens at Kew; most of this material was more than 100 years old. To view these specimens it is necessary to travel to England, since they are not loaned out; hence, the Garden's photographs have become an important research tool. The Garden's offer to exchange these photographs for plant specimens was welcomed by other Botanical institutions. In the past year we have received 1000 specimens from the National Herbarium in Pretoria; 1300 from the Nairobi East African Herbarium; and 1300 from the Government Herbarium in Salizbury.

In addition, a donation set up a fund to purchase African plants, and the yearly average of specimens received by the Garden has increased from 800, prior to 1968, to over 7,000.

The decision to officially designate a center for the study of African plants in North America has proved itself. The Garden is now visited regularly by United States scientists wishing to examine or compare plants, or by others who are doing monographic studies on cosmopolitan groups of plants.

In May, 1972, Mr. J. P. Brenan, the assistant director of Kew Royal Botanic Gardens, Kew, England, and Keeper of the Kew Herbarium visited the Garden and he gave a brief appraisal of the quality of the African Collection as compared to large collections at places such as Kew. Several areas received good comments. The results were somewhat sobering since he rated our holdings as poor to moderate for many parts of the African continent. However, most areas which were recorded as being poorly represented are poorly known botanically and most herbaria are in the same position we are. This fact in itself indicates the importance of encouraging the collection and study of African plants, for it is clear that large parts of tropical Africa, like tropical America, are barely known scientifically. Since the growing population pressures in these areas result in the loss of natural vegetation due to the need for farmland and grazing, it is imperative that the study and inventory of African flora continue at an increased pace. □

STATEMENT OF THE OWNERSHIP, MANAGEMENT AND CIRCULATION (ACT OF OCTOBER 23, 1962, SECTION 4369, TITLE 39, UNITED STATES CODE.)

1. Date of Filing: October 1, 1972
2. Title of Publication:
   MISSOURI BOTANICAL GARDEN BULLETIN
3. Frequency of Issue: 9 issues per year, bi-monthly in January-February, March-April, May-June, and monthly from July to December.
4. Location and Headquarters of Publication:
   2315 Tower Grove Avenue, St. Louis, Missouri 63110.
5. The names and address of the publisher, editor and managing editor are:
   Publisher: Missouri Botanical Garden, 2315 Tower Grove Ave., St. Louis, Mo. 63110
   Editor: Lorine Compton
6. That the owner is: Missouri Botanical Garden, 2315 Tower Grove Ave., St. Louis, Mo. 63110.
7. That the known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: None
8. The purpose, function and nonprofit status of this organization and the exempt status for Federal income tax purposes has not changed during preceding 12 months. Authorized to mail at special rates.
9. Extent and nature of circulation:

	average no. copies each issue during preceding 12 months	actual no. of copies of single issue nearest to filing date
A. Total no. copies printed **(Net Press Run)**	3900	4400
B. Paid Circulation		
1. Sales through dealers and carriers, street vendors and counter sales	25	25
2. Mail subscriptions	3463	3875
C. Total paid circulation	3488	3900
D. Free distribution (including samples) by mail, carrier or other means	300	350
Copies distributed to news agents, but not sold		
E. Total Distribution	3788	4250
F. Office use, left-over, unaccounted, spoiled after printing	112	150
G. Total **(Sum of E & F — should equal net press run shown in A)**	3900	4400

I certify that the statements made by me above are correct and complete.
(signed) LORINE COMPTON, Director of Publications

SECRETARY OF INTERIOR ROGERS C. B. MORTON AT ARBORETUM

On a day with gray skies but brilliant with the color of fall, the Garden's Arboretum and Nature Reserve at Gray Summit was officially dedicated as a *National Environmental Education Landmark*, by the Secretary of the Interior, Rogers C. B. Morton.

The National Environmental Education Landmark status was created by the National Park Service to encourage the use of outstanding locations in cooperation with non-Federal organizations, to teach the relationships between man and his environment. The Arboretum is one of sixteen sites in the United States which have been honored in this way.

The Secretary arrived by helicopter, which he boarded at the Gateway Arch, viewing the Meramec Valley on his way to Gray Summit. In the brief ceremony, he stated that the dedication of the Arboretum was ". . . part of a new program to drive some stakes into the whole business of awareness between the individual and his environment. We have not come in our time to the end of civilization. We have come to a time of opportunity when we can reconcile civilization with beauty and with the spiritual quality with which this earth is naturally endowed. Ours is the opportunity to build a second America — a second America geared to the natural beauty and to the rightful share of nature as a cohabitant of this great planet of ours — the only thing we have. The task is before us now — now more than ever."

At the close of the ceremonies, he presented Dr Raven with a brass plaque which reads:

MISSOURI BOTANICAL GARDEN ARBORETUM
AND NATURAL RESERVE
HAS BEEN DESIGNATED A
NATIONAL ENVIRONMENTAL EDUCATION LANDMARK
THIS SITE POSSESSES DISTINCTIVE VALUES
IN REVEALING SIGNIFICANT NATURAL AND
CULTURAL PROCESSES THROUGH EFFECTIVE
ENVIRONMENTAL EDUCATION PROGRAMS
1972
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

In accepting the plaque, Dr. Raven commented, "History shows that a very few moves are sometimes very important. A century ago, when Henry Shaw asked George Engelmann, a St. Louis physician to come to be the Director of his botanical garden, Engelmann replied that he couldn't because the garden was so far out in the country he would lose the time he needed for his medical practice going back and forth from the city to the present site of the Garden in town.

"In 1927 when the trustees began acquiring this land they did it because the soft coal that was being burned in St. Louis was polluting and poisoning all the plants in the Garden, and they thought this would be a refuge so far away in the country that they could grow whatever they wanted here forever. Now we find development in Franklin County, and see civilization moving further and further to the West. But thanks to the foresight of the Board of Trustees and the concern of the people of St. Louis, this 2200-acre National Environmental Education Landmark will be preserved for the use of the people of Missouri, and the Nation. We are deeply grateful for the Federal encouragement in our efforts to make this land available for these very worthwhile purposes."

This award honors the effort which has already been made and provides new impetus toward fulfilling the promise which the Arboretum holds for future generations. □

The Bulletin is published 9 issues per year, bi-monthly in January-February, March-April, May-June, and monthly from July to December, by the Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Mo. 63110. Second class postage paid at St. Louis, Mo.

**The Missouri Botanical Garden is a
Funded Member of the
Arts and Education Council of Greater St. Louis**

Gardening in St. Louis

Late Fall

Shrubs, trees and evergreens can still be planted as long as the ground is not frozen. Mulch newly planted specimens well with several inches of wood chips, compost or leaves to protect the ground from heavy frost. These plants will continue to make root growth as long as the soil is not frozen. Water heavily as needed.

Spring flowering bulbs not planted earlier should be planted as soon as possible. Delay can mean poor results for next spring.

Incorporate bonemeal (1 cup per plant) around each rose bush and mound soil or compost around each rose for protection since heavy frosts are here to stay. Roses should be cut to no more than three feet high after heavy killing frost.

Continue to cut the lawn as long as it is growing to prevent the grass from becoming too long and matting, as this causes disease.

Plenty of material is available in the form of leaves and other debris from the garden to add to the compost pile.

All annuals should be cleaned up and beds dug and left rough for the winter. Add compost now if you have it and, if possible, plant spring bulbs for added color in these beds.

Later summer flowering shrubs should be pruned now if this has not already been done. Holly and evergreens may be left to the holiday period for trimming and shaping, at which time the trimmings can be used for indoor decorations.

Garden tools should now be cleaned, sharpened and oiled before their winter rest so they are ready for spring use. Shops are not as busy now, so repairs to mowers and other equipment should be scheduled.

Bird feeders should now have a constant supply of feed for the winter birds.

This is the last chance to review the work of the season and to bring your garden notebook up to date. Jot down ideas for next spring, with plans to add one or several new plants to the garden that you have not grown. Plan to read at least one new garden book this winter. The Garden Gate Shop has several new ones for this purpose.

Avoid fertilizer on house plants now during the short days, unless they are growing actively. Cut back spindly growth to encourage new breaks. Watch for insects and spray as needed to control them.

The home greenhouse should be fully functioning now and temperatures and watering need careful consideration. Avoid overwatering and direct drafts. Seeds of many plants can be started now for early spring bloom indoors. Procure winter flowering bulbs for added color.

HOUSE PLANTS

The weather will soon discourage your gardening efforts out of doors, but a sure cure for that cooped-up gardenless feeling is a passel of house plants. Our grandmother's Aspidistra, though once again popular, has been overshadowed by a long list of importations from desert, shore, tropical rain forest, and alpine glade. There is no limit as to color, form, texture, or size of plant to fit every situation. But a word of caution! The "climate and exposure" offered by your home may be vastly different from the one in which the plant was grown and readied for sale; so you have a bit of persuading to do before a newly-purchased exotic will settle into the light, water and air microclimate of your home.

A new house plant is rather like a puppy. Training it to accept what you have to offer is a slow, step-by-step acclimatization. There are techniques for gradually weaning a plant away from its preference for its native habitat – WITHIN REASON – and therein lies the compromise YOU must make with the wishes, wants and must-haves of your indoor garden. "Within Reason" are the watch words for house plant selection. A glorious bower of bloom in a dark corner of your living room? A bower, maybe, but forget the bloom. A delicate tracery of leaves on the stairwell wall? Yes, for the right stairwell. A tractable, unusual plant near a table lamp? By all means. A row of bright flowers for the kitchen windowsill? Of course! A tough green plant for the basement playroom? Yes, but consider it expendable if a Scout troop invades.

The essence of house plantery is selection of the right plant to suit the situation, once again – WITHIN REASON. This means you have a wide latitude in choice of plants, but be prepared to expend extra effort to achieve the final result; and, also be prepared to lose a plant now and then to unexplained reasons. Sometimes, even the most gentle persuasion is to no avail, and a plant dies without telling you why.

If you are planning a low light level location for a plant, the objective you're aiming for is a gradual winding down of the plant's metabolism. It's reasonable to assume, isn't it, that a plant that is receiving less light energy will use less water and nutrients? This doesn't mean that you will buy the plant from the Growing Center or florist or nursery where it has been given high light, high humidity and copious amounts of water and nutrients, bring it home to be placed in a dark corner where it is seldom watered and never fed. Cut back on the light, water and nutrients gradually; first place the plant where it receives north light from a nearby window; water it only when the soil is almost dry; feed it lightly after it has been under these conditions for two months.

After the third month, you will notice that the leaves are hard to touch, and they are probably of a darker hue. New leaves, if any, may be smaller. At this time, move the plant to its final location, cutting back once again to watering only when the soil is dry on top; feeding only every 6 months. The humidity situation is variable. If the tips of leaves show browning, place the plant(s) on a tray of pebbles to which a little water has been added. The pots should not touch the water, and the evaporation of moisture will benefit the plants (and incidentally, your family's nasal passages).

The ten foliage plants on the following list have been selected as being the most fool-proof and adaptable:

1. **Aglaonema roebelini:** touted as the best indoor plant of all; rich green leaves, mottled with silver markings, bloom is inconspicuous, not fragrant; fruit is a bright red cluster of long-lasting berries; can withstand low light; looks well displayed in white pebble textured pottery. **A. treubii** is a smaller form with tapering silver gray leaves that looks especially well displayed in a low pewter bowl.

2. **Aspidistra elatior:** the Cast Iron plant of grandmothers parlor; large, lanceolate, dark green leaves of interesting texture; a slow grower but ideal for the basement playroom or dark hallway; makes an effective display in bright colored pottery.

3. **Aucuba japonica:** many new varieties being offered for sale; the variety **varigata** is well known as the Gold Dust Plant for its shining, dark green leaves spotted with yellow; extremely adaptable to either a sunny window or a low light situation; effective displayed in white or yellow pottery.

4. **Davallia bullata:** the Rabbit's Foot Fern with the same finely dissected foliage of all ferns, but growing from a furry brown rhizome that helps to preserve soil moisture, making this fern more amenable to the household environment than its finicky cousins; especially attractive in a hanging basket.

5. **Dieffenbachia amoena:** strong, hard leaves of this species are a dark, dull green with white markings; resistant to dust, dry air and general mistreatment; attractive displayed in copper; a strong, masculine visual effect that needs plenty of space.

6. **Dracaena Janet Craig:** a difficult plant to love unless it is displayed in a proper setting. The spiralling, dark green leaves resemble corn, and a single plant by itself is dramatic in a modern decor, but used as a background plant in a grouping of foliage plants of more delicate texture, it is equally striking. Either way, the trick in displaying it lies in choosing a short, straight-sided cylinder or octagon.

7. **Ficus pumila** is the delicate tracery of foliage for the stairwell mentioned earlier. Shaw's Garden visitors will recognize it as the profuse climber on the walls of the Growing Center and the Camellia House. For the stairwell with a ceiling or landing window, this plant is ideal. The pot can be placed in an out-of-the-way place and the stems, well-clothed with tiny round green leaves, will charmingly wander toward the light. No support is needed, but a rough plaster wall finish is necessary for the vine to attach its built-in grippers.

8. **Philodendron hastatum 'Rubrum'** is a new introduction that has undergone incredible testing to withstand mistreatment. A self-header, the large, histute leaf of shining, dark green and a red stem mark this bold, masculine foliage as a break-through in Philodendron breeding. It took a supreme horticultural effort to duplicate the native growing conditions for the parent plants of this rain forest liana to bring them into bloom so that geneticists could go to work to produce this plant. Last February, this writer observed a **P. hastatum 'Rubrum'** in a hot, stuffy, artificially lighted office. It had not been watered since the owner received it as a gift at holiday time. Still wearing its Christmas bow, it stood bright and unflagging, though somewhat begrimed with cigarette smoke residue. So, if you are forgetful of house plants, or if your office secretary is, this is the plant for you. Be prepared to pay dearly for this plant, however. In one way or another, isn't the privilege of procrastination always expensive?

9. **Schefflera actinophylla:** graceful palmate foliage is welcome in any room, but this plant is not completely foolproof. It enjoys warmth, good light and good air circulation to bring it to fullness of branching and to produce large leaves. Copper is a complimentary container.

10. **Spathiphyllum patinii 'Mauna Loa'** is unique in its ability to produce flowers under low light. The dark green leaves arise directly from the soil — a growth habit that by-passes the legginess displayed by many single-stalked plants. The crisp white flowers, resembling calla lilies, appear almost continuously for a fresh, sparkly look. The pot needs an outer covering of scrolled white basketry to set it off.

If you've chosen one or many of the above plants for the decor of your home, routine care is all that's required after they have been conditioned to carry on in their new location. Remember that more house plants are killed by over-watering than under-watering, so don't be a nervous "mother" and fuss over them too much. Wash large-leaved plants with soapy water to open dust-clogged stomata. Rinse and dry with a soft cloth to bring up the natural sheen of a smooth leaf. We don't know how you feel about it, but those glittery commercial leaf preparations leave us cold.

MEDITERRANEAN COMES TO THE GARDEN BY WAY OF CALIFORNIA

Early in October, a trailer truck arrived at the Garden, full of plants which are native to the Mediterranean region, Central Chile, the Cape region of South Africa, southwest and southern Australia, and California. These are the five areas of the world which have a similar climate of dry summers and cool, wet winters. In the United States the only region in which these plants grow outdoors is California.

The acquisition of these plants is important for the Missouri Botanical Garden, and St. Louis, for it is the first time that a collection such as this has been assembled outside of southern California. At the Garden, the plants will be growing in the greenhouse, just north of the Climatron. The shipment included shrubs, vines, trees, and ground covers. The plantings have been selected for importance botanically, as a representative collection of the Mediterranean region. Many are plants of great beauty, and others are of particular economic importance.

It has taken almost a year to gather the plants. Chief Horticulturist Robert Dingwall travelled to California last winter, visiting various botanical gardens, selecting material and having it propagated and set aside for the Garden. Materials came from the Berkeley Botanic Garden, Stanford University, Huntington Botanic Garden, Rancho Santa Ana Botanic Garden, and the Theodore Payne Foundation.

The 2000-mile journey to St. Louis required great coordination. It was necessary to ship the plants in a refrigerated truck which maintained a temperature of 70 degrees during the thirty-eight hour journey. Paul Brockmann, Grounds Foreman, flew to California and accompanied the truck as the plants were picked up from the various sources between San Francisco and Escondido. He inspected the plants and supervised the placing of the plants in the van, bracing them for the long trip to Missouri.

The material has now been planted in the greenhouse, and is adapting to the new growing conditions. The greenhouse was extensively renovated in anticipation of the new arrivals. Old planting was removed, soil replaced, old steam pipes were replaced with the new finn type which are smaller and offer greater radiation, a forced ventilation system with automatic air intakes was installed, and, to top it all, a new roof was put on.

It will be a while before the "precious cargo" is on public view. Announcement of the opening will appear in the *Bulletin*. ☐

TOUR GUIDES NEEDED

Strong feet, loud voice, one day a week
Training program will begin January 9, 1973
An examination will be taken.
For further information
Call Mrs. Barnett, 865-0440

CALENDAR OF EVENTS

Special Events

November 17	Winter Gardening Lecture — 10:30 a.m., Growing Center
November 26	Chrysanthemum Show ends
December 9	Children's Christmas Party "Botanical Zoo" — Floral Display House — 1:00 p.m. to 3:00 p.m.
December 10 through January 15	Christmas Show — Floral Display House
December 8 through January 1	Christmas Around the World Tower Grove House

Adult Classes — John S. Lehmann Building

December 13, 15	Christmas Decorations Workshop One day sessions - 10:00 a.m. to 2:00 p.m. — Coffee provided Bring lunch. (Waiting List only)

Children's Classes — John S. Lehmann Building

Saturday Nature Study

November 18	Winter Window Vegetable Gardens 10:00 — 11:30 a.m. Bring container 10"x10"x3"	$.50
November 25	Insectivorous Plants 10:00 — 11:30 a.m.	$.25
December 2	Ice caps, Snowfields & Tundra 10:00 — 11:30 a.m.	$.25
December 9	Making Christmas Cards 10:00 — 11:30 a.m.	$.25
December 16	Making Christmas Wreaths 10:00 — 11:30 a.m. Bring coat hanger bent into a hoop	$.50

CHRISTMAS SHOP

AT THE GARDEN GATE SHOP
AT THE MAIN GATE

GIFTS — BOOKS — PRINTS
10% DISCOUNT FOR MEMBERS

MEMBERSHIP NEWS

Mrs. Landon Y. Jones and Mrs. G. Carroll Stribling, Sr., helping with the Plant Sale held in October.

Mrs. Tom K. Smith, Jr., talks with guests at the Chrysanthemum Show Preview Party. Mrs. Smith is modelling jewelry from Jaccard's Jewelers, sponsors of the party for the Membership.

C. Powell Whitehead, President of the Board of Trustees, announced the resignation of Mrs. G. Carroll Stribling, Sr., as President of the Membership effective November 1, because of impending orthopedic surgery. The Garden thanks her for the many fine services which she performed during her tenure, and wishes her a very speedy recovery.

Mrs. Landon Y. Jones, elected First Vice-President last May, assumed the Presidency. Ellen, a native of Rome, Georgia, and a graduate of Randolph-Macon Women's College, has lived in St. Louis since 1941. She and her husband live in St. Louis County, and are the parents of three sons: a senior in high school; a graduate student at the Thunderbird School of International Business in Phoenix, Arizona; and a married son who is on the staff of Princeton University and the father of their granddaughter.

Our new President is a "great gardener" and dedicated to our community. Ellen has served the American Red Cross and Good Shepherd School as a volunteer, and has served on the board of the Friends of St. Louis Art Museum, Wesley House, and the Home of the Friendless. We look forward to the coming year.

The Garden is deeply grateful to two new Life members, Mr. William Pagenstecher and Mrs. Gladney Ross, and to the following new annual Members:

Miss Lucille Adams
Marianne A. Dreyer
Mr. Chas. Claflin Allen
Mrs. Louise Foshage
Mr. L. K. Ayers
Mr. Keith Spoeneman
Judy Bean
Mr. & Mrs. Roland S. Barton
Mr. & Mrs. Hunt Benoist
Miss Isabelle K. Drewett
Dr. & Mrs. Edward F. Berg
James Leo Daly
Mrs. Bettie Bode
Miss Constance Pfaff
Mrs. Louis Schwartz
Mr. Robert Boyd
Mr. Jim Q. Shelton
Miss Pam Brookmeyer
Marion L. Stalker
Miss Margaret Buerkle
Mr. James R. Burmeister
Doris Suits
Mrs. Doyle W. Chappell
Alvin H. Nissenbaum
Mrs. Lucienne Coifman
Mrs. Madonna H. Milligan
Myra Copeland
Mr. & Mrs. Raoul J. Gagne
Mr. & Mrs. William B. Crowder
Mr. & Mrs. Ralph C. Hancock
Mr. Charles H. DeCiechi
Mr. & Mrs. William A. Hartman
Mr. & Mrs. L. C. Diekmann
Mrs. Dorothy S. Higgins
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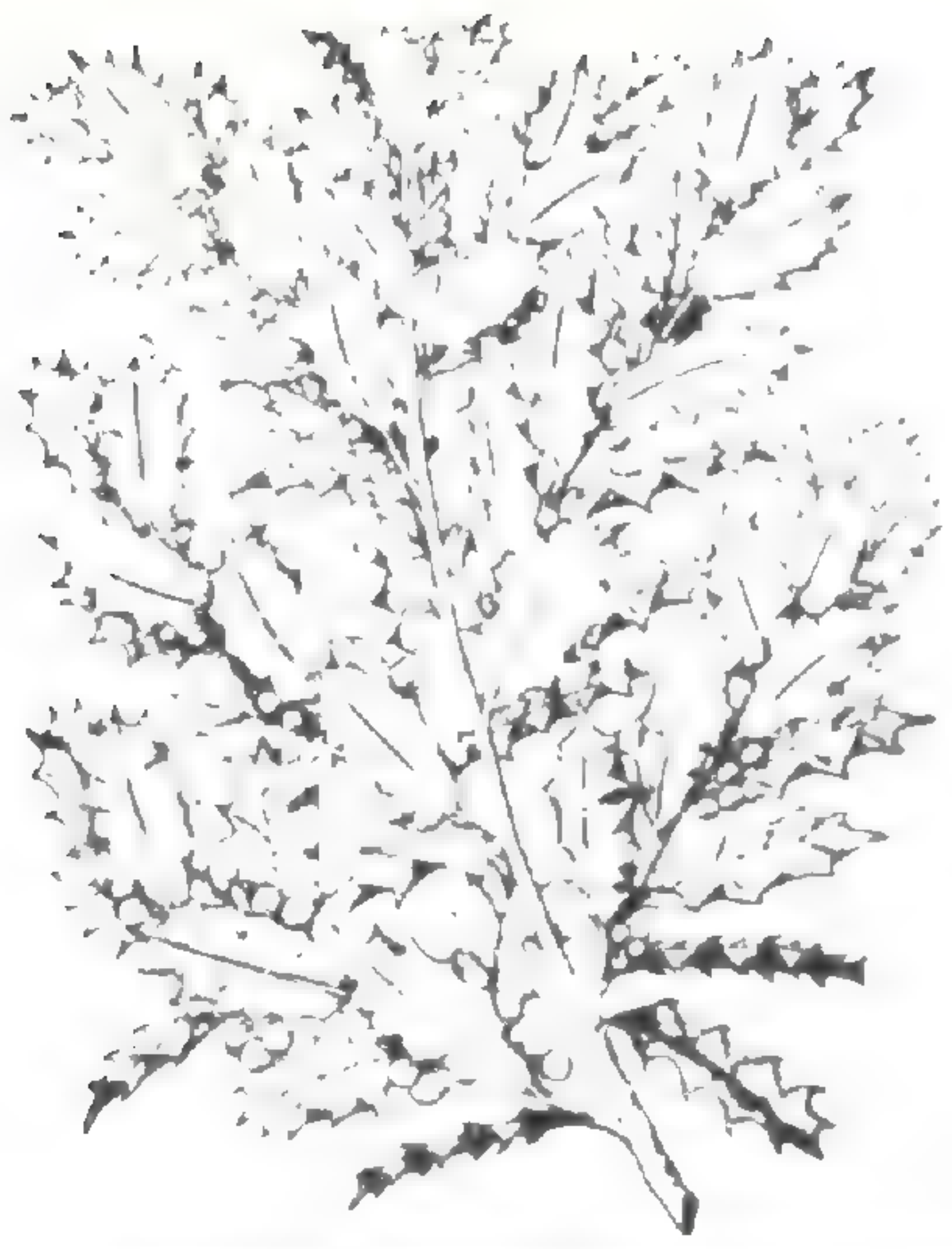

GARDEN RECEIVES GRANT TO COMPLETE THE *FLORA OF PANAMA*

Filing specimens in the Garden's herbarium.

The National Science Foundation has awarded the Missouri Botanical Garden a grant of $254,500 for the completion of a long-term study of the plants of Panama. $46,500 has been awarded for the first year of study, and the remainder is to be received over a four-year period.

The award comes at a very opportune time for it is important that the *Flora of Panama* be completed during the next five years. The geographic position of Panama is unique among areas of the world in that it separates two oceans as well as forming a land bridge between two of the richest tropical floras, those of Central America and South America. More than 8,000 kinds of plants are known to occur in this area. There are 1.6 million people currently living in Panama, and the population is expected to double in the next twenty-four years. The net effect of such explosive population growth is to rapidly destroy the natural vegetation, as the need for land for farming and grazing increases.

"As these lowland tropical forests are being cut and so drastically altered, it will be impossible to know what they were like in their original state. Some of our most valuable medicinal and food plants have come from this region, and undoubtedly other plants and animals of commercial value are being eliminated by wholesale destruction. We have a real obligation to preserve for future generations, at least a sample or a record of the plants and animals that are there," Dr. Peter Raven, Director of the Garden, said.

Flora of Panama

A *Flora* is an annotated description of all the plants growing in an area, including full descriptions, keys, illustrations, pertinent remarks, range, and an index of Latin names. Work on the *Flora of Panama* began at the Garden in 1943, and it is presently about 70% complete.

Major work involved in the project is the collection of plants in the field, comparison with herbarium specimens and written descriptions, followed by the write-up of the new material. Results will be published in the *Annals of the Missouri Botanical Garden,* which has a worldwide circulation.

The Garden is recognized as the world repository of information on Panamanian plants; the expertise of the current staff lies in tropical American plants, the collection of Panamanian material in the Garden's herbarium is the largest in the world, and the Garden reference library is of acknowledged excellence. In addition, the Missouri Botanical Garden has a field station in the Canal Zone at Summit Garden, which serves as a base for extensive field trips to gather material.

The grant will be directed by Dr. Thomas B. Croat, curator of the Garden's herbarium. Dr. William G. D'Arcy, who recently obtained his doctorate from Washington University for a study of the Panamanian members of the potato family, will continue his work, as a member of the staff.

When the *Flora* is completed, it will be an invalu-

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November 30, 1972

able aid for land use planning, agronomy, and other practical applications. More detailed research on the plants of Panama will continue at the Garden indefinitely. The education of Panamanian students and the production of popular works on the plants of the region will also occupy some of the attention of Garden scientists in the future. □

ANNUAL SYSTEMATICS SYMPOSIUM

Eagerly anticipated by numerous Midwestern biologists, the Annual Systematics Symposium sponsored by the Missouri Botanical Garden, and supported in part by the National Science Foundation, was held at the Garden in late October. This meeting brought together botanists and zoologists with many different interests for an exchange of ideas and information.

The Symposium program focuses on a central topic each year. The theme is always one of great current interest, and one in which a great deal of active research is being conducted by systematic biologists. Usually equal numbers of botanists and zoologists are chosen as speakers, resulting in an important exchange of viewpoints between these disciplines. Speakers include well-established researchers with national and international reputations as well as young researchers with exciting new discoveries and ideas. Such a program has made this a quality Symposium and insures that participants will be stimulated with new ideas and approaches for their own research.

Topics of recent Symposia have included such titles as: "Tropical Island Biography", "Hybridization, Evolution, and Systematics", and "The Role of the Systematist in the Environmental Crises," The theme for the Nineteenth Symposium (1972) was "Systematic Studies in the Lowland Tropics." It was a very appropriate one for the Missouri Botanical Garden with its long interests in the flora of Panama, British Honduras, and other neotropical areas.

The Symposium was initiated 19 years ago by four Garden staff members: Hugh Cutler, Robert Woodson, Ronald Tryon and George Van Schaack. It has increased in popularity ever since that time, evidenced by the fact that some requests for attendance have had to be turned down every year because of limited seating capacity. With new facilities of the Lehmann Building it was possible to accommodate a record number of 325 participants for the Symposium in 1972, including staff, speakers from throughout the United States and Mexico, and, as special guests, prominent Latin American botanists from Mexico, Central America and South America. Historically, the Symposium was intended and has continued to bring together botanists and zoologists from the Midwest. However, because of the quality of the program, interest has been so great that participants have come from much greater distances. Registered participants in 1972 came from 31 states as well as Canada, the Canal Zone, and Honduras.

Dr. and Sra. Gómez-Pompa from Universidad Autónoma de Mexico, Mexico City.

The Missouri Botanical Garden is a Fund Member of the Arts and Education Council of Greater St. Louis

The Bulletin is published 9 issues per year, bi-monthly in January-February, March-April, May-June, and monthly from July to December, by the Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Mo. 63110. Second class postage paid at St. Louis, Mo.

Graduate students are always encouraged to attend. For them, the Symposium is an important chance to make professional contacts and to interact on a personal level with persons they may only have known through research articles. This plus the chance to view and use the facilities of the Garden makes the Symposium an important broadening experience.

The large and varied holdings of the library and the herbarium have made the Missouri Botanical Garden a leading center for systematic botany in the Midwest. Both facilities are very heavily used by Symposium participants. With the opening of the Lehmann Building, it is clear that the position of importance for the Garden has been increased. As pointed out in introductory remarks to the 1972 Symposium by the Director, Dr. Peter Raven, these excellent new facilities also bring with them a greater responsibility for cooperation and service to other institutions. Our determination to do so was eloquently presented by Dr. Raven. □

FLORA OF CENTRAL AMERICA

A unique event closely tied in with the theme of the 1972 Symposium was an extra day of discussions concerning the desirability and feasibility of producing a *Flora of Central America* as well as a consideration of priorities in tropical floristic research. This event was co-sponsored by the Missouri Botanical Garden and the Botany Department of the Field

Dr. Louis O. Williams, from Dept. of Botany, Field Museum, and Dr. Thomas Croat, Curator of the Garden's herbarium.

Museum of Chicago. Members of the Field Museum have been actively working on the *Flora of Guatemala* and *Costa Rica* for many years. Especially invited to present their viewpoints were six Latin American botanists. They included Lic. Correa from Panama; Dr. Forero, a Colombian botanist; Sr. Gómez from Costa Rica; Sr. Molina, a native of Honduras; and two Mexican botanists, Dr. Rzewdowski and Dr. Gómez-Pompa. An American botanist, Dr. Dennis Breedlove, working in Chiapas, Mexico, also attended the Symposium as a special guest.

The meeting was successful in identifying problems and some possible new directions for systematic studies in the tropics. A majority of those attending expressed the idea that the time for producing a comprehensive *Flora of Central America* was premature, largely for two reasons. The flora of the area is not yet sufficiently known, and closely related to this, plants and animals are disappearing in unprecedented numbers from most tropical areas because of exploding populations and advancing technology.

The possibility that the products of millions of years of evolution will completely disappear from the face of the earth is thus very real. Of immediate concern then, especially to institutions such as the Missouri Botanical Garden, is an intensive and aggressive collecting program that concentrates its efforts in the most endangered areas to insure that at least a small sample of the original vegetation is saved for future study. High priority areas were identified as the tropical lowland rain forest and the mountain forests which tend to be very rich in endemic species. For this reason, it is hoped that the Missouri Botanical Garden can very soon initiate the most comprehensive collecting program in its history.

"NATIVE PRAIRIES OF MISSOURI" EXHIBITION

"Native Prairies of Missouri," a photographic exhibit by Leland Payton, will be on display in the lobby of the Education Department in the John S. Lehmann Building throughout the month of December. The exhibit was produced for The Missouri Prairie Foundation, and is sponsored by the Extension Division, University of Missouri - Columbia. This is the first showing in the St. Louis area. For this showing at the Garden, there is an additional display of herbarium specimens of native prairie plants from our collection.

The photographs capture the beauty and solitude of a prairie — a world apart from buildings, roads, fences, fields with symmetric rows of cultivated plants. Prairie is a community of about two hundred kinds of grasses, forbs, and flowers that serve a diverse population of birds, mammals, insects, reptiles, amphibians and arthropods. Hawks, prairie chickens, bullsnakes, meadow mice, metallic yellow spiders, and giant fritillary butterflies, interlocked with grasses like big and little blue stem, Indian grass, Canada wild rye, and with flowers like blazing star, phlox, gentian, and ladies tresses orchids — all intertwined in a self-regulating system rich in its lush plant growth, controlled by its consumers, stabilized by its predators.

Today, there are only about 75,000 acres of such native prairies in Missouri, where once there were millions of acres.

A deep, dark, fertile soil evolved under the tall grass prairie. Unfortunately, this has proved to be the greatest danger to its further existence, as man, with his ever increasing numbers and increased need for food, has ripped up the sod and converted it to farms. Increasingly, this unique vegetation is disappearing from the face of the earth.

Many of the botanists who worked in Missouri in the 1800's and early 1900's were still able to enjoy the beauty and investigate large tracts of nearly undisturbed prairie, making large collections of these prairie plants in the process. These collections now stored in the herbarium of the Missouri Botanical Garden, and other herbaria, form an important part of the record of that original vegetation. Included in the display of herbarium specimens are some of the most important prairie plants, collected by a few of the early Missouri botanists who have contributed most to our knowledge of the state's flora and vegetation. ☐

If you would like more information on Missouri prairies or on other projects of The Missouri Prairie Foundation, please write:

The Missouri Prairie Foundation
Box 200
Columbia, Missouri 65201

EARLY WINTER

The garden season now officially over still has many things to offer. This is a good time to catch up on horticultural reading. Enjoy your garden library. Acquaint yourself with the new books offered. Visit your public library and look over their stock of garden books — and don't neglect the older ones. There is a mine of good information contained in the best old books.

Subscribe to one or more good magazines (*Horticulture* by Massachusetts Horticultural Society is ideal) and, for Christmas and that special friend, why not check the Garden Gate book shop or better still, give a year's membership to the Garden.

Mulch the late-planted bulb and perennial beds to protect the plants from heaving due to the heavy frosts from now on. This is the last chance to add needed mulch to roses if this was not done earlier.

All garden tools should be cleaned, oiled, sharpened and put in proper working order ready for the spring season.

Fertilizing house plants should be largely suspended in dull weather.

Amaryllis bulbs may be started now. If these are established bulbs in old pots, two inches of soil should be removed from the surface and replaced with a good, rich mixture.

Cold frames need special attention. In mild weather, airing the frames is important. Prop the sash up a few inches for an hour or so during the warm part of the day. Water only if they become dry, only during warm spells, and then early in the morning so plants can dry off. Add extra covering in real cold weather, if needed.

The home greenhouse can now be run cooler than earlier in the year. A night temperature of 55-60 with a 5-10 degree rise during the day is sufficient. Ventilate as needed for fresh air. Watch watering and feeding and don't overdo at this time. Give plants all the light they can receive during these short days. Watch for insect and disease problems and spray as needed to keep good control. For plants needing more light, 4 hours per day of extra growing light is ideal from 6-10 p.m. A timer installed to do this is ideal and saves watching the clock.

Christmas gift plants, such as Azaleas, Poinsettias, Cyclamen and others, should be given good light during the day and plenty of water while in bloom. Place plants in a cool position at night as this will help them to last longer.

Place orders now for seed catalogues so as to get orders placed early in the new year.

Be sure to have all bird feeders in place and well supplied with bird food. Scraps of suet attract the downy woodpeckers, nuthatches and others. ☐

INDOOR PLANTSCAPING CONTINUED

Last month we talked of training a house plant to accept what your home has to offer. This month we can expand the list of unusual, out-of-the-ordinary plants, but more particularly, we'll go into reverse and list the plants that are not only poor subjects for adaptation to home conditions, but will keep you jumping to meet their demands. If this ominous sentence conjures up the spectacle of an angry, tearful baby banging on his highchair tray, that is what is intended, and if you haven't turned the page or wandered off by now, we might add that, whereas last month's *Bulletin* "Gardening in St. Louis" article listed only one plant that blooms, this month's list will contain bloomers, and with a bonus of those with colorful foliage and unusual growth habit. To set the scene a little further, let us define that this list contains plants that will bloom and produce fruit *in situ* — not those that are best grown elsewhere, such as in the home greenhouse or solarium, and brought into the home for display when they are in bloom, i.e. orchids. Also, the list is further narrowed by excluding the oddities of the plant world that could prove to be glaring blunders in home decor. For example, very few tastefully furnished living rooms need the addition of a Tiger Jaws (*Faucaria tigrina*) or a Staghorn Fern (*Platycerium alcicorne*) to complete the decor, and if your penchant leans this way, yours is a special circumstance that cannot here be generalized.

Everyone loves the ornamental citrus group — the Ponderosa Lemon (*Citrus limonia ponderosa*), the Calamondin Orange (*C. mitis*), the Otaheite Orange (*C. taintensis*), or the little shrubby Kumquat (*Fortunella crassifolia*), which is closely allied to the Citrus group. The waxy white blooms and colorful fruits are borne simultaneously and continuously, filling the air with a delicious mixture of sweetness and tang. The fruits are edible, if you can bear to part with them as ornaments, though the lemons run short on juice and long on seeds. The little plum-sized oranges have a lime flavor. All of the citrus group like five hours of sun each day or nine hours of bright light (natural or artificial). Soil requirements aren't difficult — the commercial potting soil is fine. However, unless you are a Spartan, the temperature requirement of the citrus group is difficult. For slow, even growth that makes a shapely plant that will bloom and set fruit, the citrus like a day temperature no higher than sixty degrees. They are even happier if the night temperature hovers around forty-five degrees. This may eliminate the citrus group for you, but, remember last month when we discussed 'conditioning' a plant to accept what your home has to offer? The citrus group can be acclimatized gradually to a warmer temperature — up to a point of about seventy degrees daytime and sixty degrees night, above which they show their displeasure by dropping their leaves, blooms, and fruits, or developing awkward sparsely-clothed side shoots. A cool sunporch is the standard location for this group, but a sunny entrance hall is also acceptable to them. A nearly dry soil between waterings and a close watch for scale insects and red spider mites completes their demands. A flip of a leaf to examine the underside will soon train your eye to trouble signs. The scale beasties are devious in their manner of building themselves an almost impenetrable waxy cover, under which they carry on their dirty work during their immovable stage. This "house" usually resembles a brown bump, adpressed to the stem, axil, or leaf surface. Unless you are going in for quantities of plants, pick-pick-pick is the best control for scale. Simple thumbnail pressure will flick them away. In their crawling stage they are almost invisible, but very vulnerable to a malathion spray. Red spider mites are also no-see-ems, but the tell-tale yellowing leaves and fine webs on the leaf under-surface announce their presence loud and clear. Frequent syringing of the leaf under-surface with a strong spray of water will discourage this pest. We might add, however, that the presence of red spider mite indicates a too warm temperature, for mites cannot live or multiply in the cool range.

The Calla Lily Begonia is a deceiving charmer. Its root, leaf, bloom, and growth habit announce its membership in the semperflorens group — those fibrous-rooted summer bedding plants that are heavy blooming and generally amenable in sun or shade. The resemblance stops short of 'generally amenable', however, for it is notoriously unpredictable. A self-confessed amateur often has better luck with this plant than an experienced gardener. The basal leaves are pale green, with each successive leaf shading lighter until the newest leaves are pure white with a crystalline sheen. The flowers are pink, white, or ruby red. Although many individuals perform for years, becoming perfect models of tractibility, another plant or even a cutting from a placid plant, can lapse into sudden paroxyms of temperament. Be prepared for unexplained or heretofore unknown complications. As with any begonia, if the leaf feels warm to the touch, the plant is not happy. For a compact plant, mix one-half cup of sterile sand and a tablespoon of bonemeal with the standard pasteurized potting soil for each four-inch clay pot. Callas prefer the cool temperatures found on an east or northeast windowsill, and dislike being moved to a new location. Water is critical for them, for they cannot be allowed to dry out, and they resent the chlorine in city water. Use rain water or allow tap water to stand in an open vessel overnight so that chlorine will dissipate. Apply the water around the rim of the pot, never on the crown of the plant. Strangely, these plants are reported to dislike the company of other species, but a row of them in tandem is a wondrous sight.

Aphelandra squarrosa is the familiar Zebra Plant that is a popular seller in super-markets and garden centers. Erect growing, pairs of opposite spear-shaped shiny green leaves are prominently veined with white. The bright yellow flowers emerge from a spike of waxy golden bracts, borne like miniature Chinese temples. Though the Zebra Plant is hard to kill, it is equally hard to grow to a shapeliness that allows it to remain on display at all times. The secret lies in pinching out soft-wood tips to force branching. The plants prefer a warm temperature of seventy to eighty degrees, a rich loose soil, filtered sunlight (such as through a sheer curtain), and an always moist but never soggy soil. After blooming, they should be rested for three months, running them a little dryer and with no feeding.

Those who love gardenias love them well, and those who dislike them, hate with an equal vehemence. The most often heard complaint is that the plants grow well and are happy in the home, but just when buds are fat and promising, they droop suddenly and buds turn brown and fall. Gardenias when in bud not only need constant moisture and plenty of light, but also need constant feeding of a weak nutrient solution applied at each watering. They are heavy users of iron, and the application of ferrous sulphate (Green Gard), according to directions on the package, must be regularly applied.

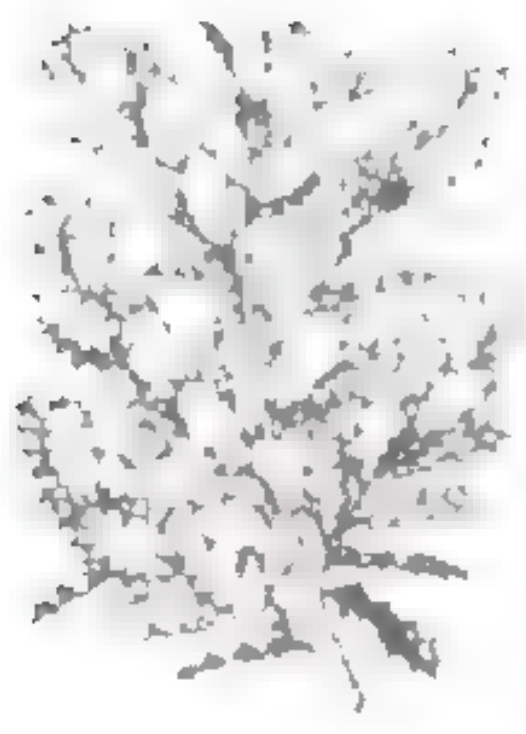
The palms, in variety, are the graceful, durable decorations of home and office; yet few people understand them and a well-grown specimen is seldom seen. In their native habitat, their roots reach deep for water and they cannot be allowed to dry out completely. Like their compatriots, the camels, they can go for a long period without water, but when they need it, it must be a long and copious drink. Soak them thoroughly, setting them in a tub for complete saturation. If tips brown, it is a sign of drying or of being allowed to become chilled at a time when the soil was wet. To keep them free of dust once they have attained large size, they need a bath in the bathroom shower. Allow the plant to drip dry quickly afterward. Turn up the thermostat if necessary. To avoid waterlogging the soil during the shower bath, slit a foil pie plate from the rim to the center; turn the cut edges barely under, and slip the plant around the stems and over the soil surface of the pot. Only a small amount of water will find its way through the slit. ☐

PITZMAN SURVEYS THE GARDEN

The first major step in the development of the Master Plan for the Missouri Botanical Garden has begun. The Pitzman Company, which was established the same year as the Garden, 1859, is doing the survey of approximately seventy acres from Magnolia to Shaw, and from Tower Grove to Alfred avenues. Pitzman was awarded the contract on the basis of competitive bid by twenty companies. The final map will show relief features at one foot contour intervals and the elevations of all buildings, fixed objects, ponds, brooks, roads and other physical features. In addition to representing all physical features, the maps will show locations of all plantings which are over four feet in diameter

Surveying the Garden will be an unusual job, according to Roy Leimberg, President of the Pitzman Company. Ordinarily, a survey is done in preparation for a new development. Trees and other obstacles can be removed – cut down or torn down – in order to stretch the lines. The project at the Garden is a detailed mapping of existing objects. Nothing will be removed, and the instruments will have to be moved around each object. To save time, a new electronic measuring device, the distomat, will be used. With this instrument, it is possible to measure a distance of 3000 feet, the length of the Garden on Tower Grove, in fifteen minutes – a job which would take from four to six hours by stretching lines and the measurement is more precise.

It's like old times for the Pitzman Company to again be working at the Garden. Records indicate that this is the company that did the work when the Administration Building was constructed in 1904. And it is the estate of one of the original founders of the Company which provides the funds for the Pitzman Summer Nature Program, which is held at the Arboretum each year.



Yuletide at the Garden

TOWER GROVE HOUSE CHRISTMAS ROUND THE WORLD

For this holiday season, decorations throughout the rooms of Tower Grove House, the country home which Henry Shaw built in 1849, portray the warmth and sentiment of Christmas traditions from "Round the World." There will be an English Victorian Christmas, and an American Victorian Christmas; a Swiss Peasant Christmas depicting the legends of Saint Nicholaus; and a German Christmas – so much a part of the heritage of Saint Louis. The Mexican Christmas revolves around the *nacimiento*, or manger scene, and an Oriental theme is present in floral arrangements done in a Japanese manner.

The kitchen bedecked with aromatic herbs and spicy gingerbread men foretells the Christmas feast, and a display of dolls from around the world, a visit from Santa. The doors and windows and elegant staircase of the house, decorated with swags and wreaths, reflect the traditions of American Colonial days.

The settings were designed and executed by the following groups from the St. Louis area: Uandi Literary Club of St. Louis, Twentieth Century Art Club of St. Louis, Little Gardens Club, Garden Guild, St. Louis Herb Society, Ladue Garden Club, Rowena Clark Garden Club, The Planters Garden Club, The Garden Club of St. Louis, Delmar Garden Club; and Mrs. Ralph Kraus, Mrs. W. A. Payne, Mrs. W. W. Boyd III, Ms. Lillian Stupp. Their enthusiasm and generosity are deeply appreciated.

"Christmas Round the World" will be on display from December 9 through December 29. Tower Grove House is open every day from 10 a.m. to 4 p.m., except Christmas Day. Admission is $.75 for adults, $.25 for children 12 and under. Members of the Garden are admitted free of charge.

CHRISTMAS FLOWER SHOW FLORAL DISPLAY HOUSE

Holiday flowers – poinsettias, azaleas, Christmas cherries, kalanchoe, cyclamen, chrysanthemums, Christmas peppers – will be displayed against a background of traditional greens, wreaths, and swags, for the Christmas Flower Show held in the Floral Display House from December 9 through January 15. A St. Louis tradition, the Garden has had holiday flower shows since 1912, when the Palm House was built and there were facilities to stage such a display.

Through the years, the flowers have changed, as new varieties have been developed, but the greens which appear – fir, balsam, juniper, boxwood – are a tradition of the season dating from the Renaissance.

Wednesdays at 11 a.m. during the show, the Talk/Walk lecture and tour of the show highlights legends of holiday plants, and provides hints on caring for them in your home.

BAKE SALE TO BENEFIT THE GARDEN MUSEUM BUILDING

Members of the Garden Clubs in the East Central District of the Federated Garden Clubs of Missouri, and the St. Louis Horticultural Society, are sharing the products of their Christmas kitchens for the benefit of Shaw's Garden. The sale will be held Friday, Saturday, and Sunday, December 15-16-17, in the Museum Building at the Garden from 10 a.m. to 4 p.m. Visit "Christmas Round the World," the Flower Show, and take home some delicious goodies from the Garden.

A BOTANICAL ZOO
FLORAL DISPLAY HOUSE

"Catnip" – "Lamb's Ear" – "Horsechestnut" – "Rabbit's Foot Fern" and other inhabitants of a Botanical Zoo will be on view in the mini-display for little people in the Floral Display House during the Christmas Show.

CHRISTMAS COLLAGE – DECEMBER 17
PERFORMING GROUPS OF FOREST PARK COMMUNITY COLLEGE

The Music Department and Theater Department of the Forest Park Community College will present a "Christmas Collage" – a performance of Renaissance Carols, and readings pertinent to the Holiday Season, on Sunday afternoon, December 17 at 2 p.m. The groups will appear in the Floral Display House, the Christmas Flower Show as a background. COME!

GREETINGS FROM THE DIRECTOR

As the wonderful and eventful year of 1972 comes to an end, we hope you will remember the Missouri Botanical Garden as an institution worthy of your support. The Garden is an incomparable resource for the community, and one of the reasons that living in St. Louis is aesthetically and culturally rewarding. Visitors come from all over the world to see the Climatron, the orchids, and Tower Grove House; and to use the research materials housed in the magnificent new John S. Lehmann Building. Thousands of school children and adults attend classes each year. A decade of growth has set the stage for our new master plan, and for the physical and intellectual elaboration of the Garden and the Arboretum that will be carried out during the remainder of the 1970's. To achieve these goals, and to provide even better services to the people of the Greater St. Louis area, we are dependent upon your generosity.

A TRIBUTE

Since 1939, the Missouri Botanical Garden has received support from individuals in the St. Louis area through its membership organization, to supplement the income of Henry Shaw's will. As a private institution, the Garden receives no tax support. We pay tribute to the Members of the Garden, whose gifts have enabled us to continue to grow, and to the following Life Members whose gifts to the endowment have expanded the dream Henry Shaw had for his Garden:

Mr. and Mrs. Howard F. Baer
Miss Nina K. Bernd
Mrs. Fred J. Blum
Mrs. Marion C. Blossom
Mr. and Mrs. Herman Bowmar
Mrs. Kenneth Carpenter
Mrs. Clarkson Carpenter
Mrs. Theron E. Catlin
Mr. and Mrs. Adolph G. Clodius
Mr. and Mrs. Sam'l C. Davis
Mrs. Joseph Desloge
Mrs. Charles S. Drew
Mr. and Mrs. H. Richard Duhme, Jr.
Mr. and Mrs. Leicester Busch Faust
Mrs. Walter P. Goodwin
Mr. and Mrs. John H. Hayward
Miss Flora E. Henke
Mr. and Mrs. Henry Hitchcock
Mr. and Mrs. Adolph M. Hoenny
Mrs. Arthur C. Hoskins
Mrs. John V. Janes, Sr.
Mrs. Earl M. Johnston
Mr. and Mrs. J. F. Kalbfleisch
Mrs. Royal D. Kercheval
Mr. and Mrs. Elmer G. Kiefer
Mr. and Mrs. Theodore Lange, Jr.
Mrs. John S. Lehmann
Mr. and Mrs. David S. Lewis
Mr. and Mrs. Joseph W. Lewis
Mr. and Mrs. Tex McClintock
Mrs. Edward Mallinckrodt, Jr.
Mrs. Stratford Lee Morton
Mr. and Mrs. Fristoe Mullins
Mr. and Mrs. Spencer T. Olin
Mr. William Pagenstecher
Mr. and Mrs. Vernon W. Piper
Mr. and Mrs. Duaine Pryor
Miss Viola Reynolds
Mr. and Mrs. Howard E. Ridgway
Mr. and Mrs. Kenneth Robins
Mrs. Gladney Ross
Mr. and Mrs. Louis S. Sachs
Mr. and Mrs. Tom K. Smith, Jr.
Mr. and Mrs. A. M. Stevens
Mrs. Oscar Stroh
Mrs. Owen J. Sullivan
Mr. and Mrs. Joseph Sunnen
Miss Sylvia Walden
Mrs. Jacob Wallach
Mrs. Horton Watkins
Mrs. Ann M. Wendell

CALENDAR OF EVENTS

Special Events

Dec. 9 1 p.m. to 3 p.m.	Children's Christmas Party "Botanical Zoo" Floral Display House
Dec. 15, 16, 17 10 a.m. to 4 p.m.	Bake Sale to benefit Garden Museum Building
Dec. 17 2 p.m.	"Christmas Collage" – Holiday Program – open to public. Forest Park Community College Floral Display House
Dec. 10 thru Jan. 15	Christmas Flower Show Floral Display House
Dec. 8 thru Jan. 15	"Christmas Round the World" Tower Grove House
Dec. 1 thru Dec. 30	"Native Prairies of Missouri" Photographic Exhibit Education Department John S. Lehmann Building

Wednesdays December 11 a.m.	Talk/Walk – Lecture and Tour Floral Display House

Adult Classes

Jan. 18, 25	Botany for People
Feb. 1, 8, 15, 22 10:00-11:30 a.m.	John S. Lehmann Building Fee: $18, Members $14

Children's Saturday Nature Study

10-11:30 a.m.	John S. Lehmann Building	
Dec. 9	Making Christmas Cards	25¢
Dec. 16	Making Christmas Wreaths (bring coat hanger bent into a hoop)	50¢
Jan. 13	Tabletop Greenhouses (bring 1 lb. coffee can and plastic bag to cover)	50¢

HIDDEN TREES –

Can you find the sixteen trees in this story?

We went to the woods the other day to see the trees in their autumn color. The colors were overwhelmingly bright. Some trees even had brightly colored buds. We met the blind Englishman, whose face darkened as he heard our footsteps at some distance for he has very sharp ears. He was a preacher in a very popular church when his trouble began. His daughter, Lucy, pressed him to see an oculist and mama pleaded with him, but in vain. He repines constantly and grows grayer and balder. He has made his will, owing to his ill health, and has made them lock up all his books. Hope can keep one up under affliction, but he has no hope and the poor man, who has been as busy as a bee chatting pleasantly with every one, has become morose and taciturn and sunk into a kind of lethargy.

MISSOURI BOTANICAL GARDEN BULLETIN
2315 Tower Grove Avenue
Saint Louis, Missouri 63110

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Missouri Botanical Garden Bulletin

From the Director

1972 was the 114th year in the history of the Missouri Botanical Garden, and the first year under the leadership of Peter Raven, the Garden's sixth Director. The following are some of Dr. Raven's reflections on the Garden's past, thoughts on his first year in St. Louis, and expectations for the Garden in its second Century.

When I was offered the directorship of the Missouri Botanical Garden, it seemed to me that it was a great challenge. By that time I had been a University professor for ten years, and I felt that I knew something about the challenges and the opportunities of coming to St. Louis. The position of the academic world is becoming increasingly alienated, or separated, from the main currents of society: the role of the University in the modern world is that of a commentator, or observer, and not, perhaps, a participant. The University may function independently, and may comment on and, in an intellectual sense, attempt to direct the major currents of society, but it is not in a position to interact directly with the people.

Now, an institution such as the Missouri Botanical Garden is an extremely fascinating one in these same respects. It is a grand old institution, 114 years old this year, and very much loved by many members of the community, located almost exactly in the geographic center of the City of St. Louis, and obviously with great potential for affecting the attitudes of people in this city towards nature. We hear a lot about issues such as conservation, ecology, and the like, and yet who, or what institutions, or what people are going to change our attitudes toward these causes? Who will give the vast majority of people in an area like St. Louis an appreciation for nature? An understanding of plants?

There are very few cities that are fortunate enough to have an institution such as the Garden. New York has a very comparable institution – San Francisco – a lesser one, most cities, none at all. Interestingly enough, Chicago is right now engaged in building a botanical garden because they realize the importance of it.

1849 to 1972

The Missouri Botanical Garden has the potential for not only broadening the love of the people in St. Louis for beauty and nature and horticulture and plants, which is what Henry Shaw intended, but also for participating in the changing social currents in one of the great metropolitan centers of the United States.

I was very glad to have the opportunity of coming here, to express myself in a different way, and to participate in (to whatever extent might be possible) continuing to make St. Louis a good and fruitful place to live.

Henry Shaw first saw the land which is now the Missouri Botanical Garden when he was a young man of 19, in 1819. Thirty years later, when he was essentially in semi-retirement from his day-to-day business affairs, he built Tower Grove House, now beautifully restored, as his country home on that land. The central part of St. Louis was in the

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downtown area, and in the 1840's, the area around the Garden was rural – an agricultural area. Wide, fertile farms stretched on all sides from his country estate, and from the top of the tower in his home, he could look out and get a very wide view of these farms and scattered houses, which lay between what is now Grand and Kingshighway.

1859, when he established the Missouri Botanical Garden, Mr. Shaw offered Dr. George Engelmann, who was an amateur botanist of great standing, the position of Director of the Garden.

Dr. Engelmann refused for two reasons – and they're both quite interesting in the present context! He felt that because the Garden was so far from the central part of St. Louis, that if he had to come out there frequently as Director, he would be drawn away from his medical practice which lay in the main part of the City. The second reason was that Engelmann had made a consistent, and not wholly successful effort up to that point, to convince Henry Shaw that the scientific investigation of plants, in order to improve them for aesthetic reasons as well as for better crops, was just as important as the horticultural appreciation. Shaw saw the Garden, initially, when he was founding it, as a very pleasant and beautiful and attractive country estate – not necessarily as a center for scientific study or further appreciation of nature.

Gradually, through the efforts of Engelmann and others, Shaw's views began to evolve in the direction of establishing the Garden as a center for scientific works, and the library and herbarium were begun. And so, what would have been a beautiful country estate on the outskirts of St. Louis, where people could come to appreciate and enjoy a wide array of different kinds of plants, expanded into an institution with the additional two goals of the Garden of the present day – education and scientific research.

Henry Shaw directed his Garden from 1859 until his death in 1889. His will states, . . . *I have for many years been engaged in laying out and establishing a botanical garden, with a museum and library . . . now known as the Missouri Botanical Garden, with the design at the time of my death to convey the same with other property to Trustees for the object and with the view of having for the use of the public a Botanical garden easily accessible, which should be forever kept up and maintained for the cultivation and propagation of plants, flowers, fruit and forest trees, and other productions of the vegetable Kingdom; and a museum and library connected therewith, and devoted to the same and to the science of Botany, Horticulture, and allied objects . . .*

There shall always be a Director to said Botanical Garden, and institution, to be appointed as hereinbefore provided, and he shall have the general superintendance and charge over the garden grounds, museum and library of said Botanical gardens . . .

The first Director, after Henry Shaw, was William Trelease, whom Shaw himself recruited, and who was Director from 1889 until 1912. Trelease was, like Engelmann, a scientist and one interested in systematic botany. He continually worked with the Board of Trustees, which began to function after Shaw's death in 1889, to develop the scientific aspects of the Garden and yet not to decrease the horticultural and display aspects – but also to add on a layer of scientific activities here.

Shaw's townhouse, which had been located at 7th and Locust, was moved to the Garden in 1892 as requested in his will. The house became the place where the herbarium and library, which had been enriched by purchases that Engelmann had pursuaded Shaw to make in Europe, were located. Then in 1908 the herbarium and library, which were growing larger and larger, threatened to overflow this house, and a large wing (adding about two-thirds more area) was constructed to the south. This wing was the seat of the herbarium and library which expanded so much that they filled the entire wing and the original house, until this year, when the John S. Lehmann Building was completed at the Garden, and to which the entire library/herbarium was moved.

Trelease shaped the Garden into its present form: science, education, and horticultural components in one large and closely interrelated system. Towards the end of his stay at the Garden, he conceived the idea of having large greenhouses and conservatories and display houses of various kinds in which the public could see many kinds of plants not otherwise present in the St. Louis area. Dr. Trelease brought George Pring who had been a student at the Royal Botanic Garden, Kew, as Chief Horticulturist in 1906. With Pring's help, a whole series of greenhouses was planned. In 1912, Trelease joined the faculty of the

University of Illinois, where he had a very distinguished career, subsequently.

George Moore, who had come to the Garden in 1908 as a plant physiologist, one of the scientists brought into the Garden by Trelease, became Director in 1912 and built a new Director's residence, in the southeast corner of the Garden. This residence was completed in January 1914 and has been the director's residence since. (Before that, the directors lived in Tower Grove House.)

Dr. Moore, in his early years at the Garden, further developed the conservatories and greenhouses that Trelease had begun . . . actually built them. He constructed the lovely palm house which was such a feature of the garden until the late 1950's, when the Climatron was built in its place, and a series of other display houses which have been familiar to the residents of St. Louis from about 1915 onward. He began to turn the Garden inwardly, you might say, because the emphasis became more and more on indoor display of spectacular and bizarre plants, and less and less on the kinds of outdoor plantings which had been important in the latter part of the 19th century and the early part of this century. Dr. Moore was Director from 1912 until 1953 – a very good long span of time – and during his time as Director the connections with Washington University's School of Botany, which had been set up by Henry Shaw flourished. A number of notable scientists worked both at the Garden and at the University and helped to contribute to the development of their fields of study.

One of them – Edgar Anderson, known and appreciated by many people in the St. Louis area, served briefly as Director following George Moore. Dr. Anderson was by no means cut out to be an administrator, however, as he fully appreciated himself, and had only a brief tenure in this capacity. He was a brilliant scientist and botanist and made many outstanding contributions to the study of plant evolution.

The next Director of the Garden was Frits Went, 1958 until 1963, who grew up in Indonesia, and is a leading student of plant physiology. Both his father and grandfather were notable botanists. Went, while at Cal Tech, had developed the idea of very closely controlled environmental conditions for plant growth. In Pasadena, he built a series of controlled environmental chambers – collectively called *The Phytotron.* This was a series of rooms in which temperatures, humidity, and light could be regulated closely, much more so than was possible in greenhouses until that time. In 1958 he came to the Garden, first on a temporary basis, to see what possibilities there would be for similar developments here. One of his leading ideas was to construct the Climatron. Taking the then much less well developed and appreciated ideas of Buckminster Fuller concerning geodesic domes, he conceived the idea that in such a large dome it should be possible – by heating the air at one point and drawing it out at another point very far removed on the other part of the dome – to produce a very long gradient with a whole variety of rather precisely controlled environments. The control turned out to be not as exact as Dr. Went had hoped, but the Climatron does afford a variety of habitats and is of course an excellent and spectacular tropical greenhouse. Completed in 1959, it has become a symbol, I would say, of the resurgence of the Missouri Botanical Garden that has gone on since then. To a certain extent, it has also become one of the symbols of St. Louis nationally. It's doubtful that the Garden could have reached the kind of impetus and forward-looking growth which it has without the Climatron.

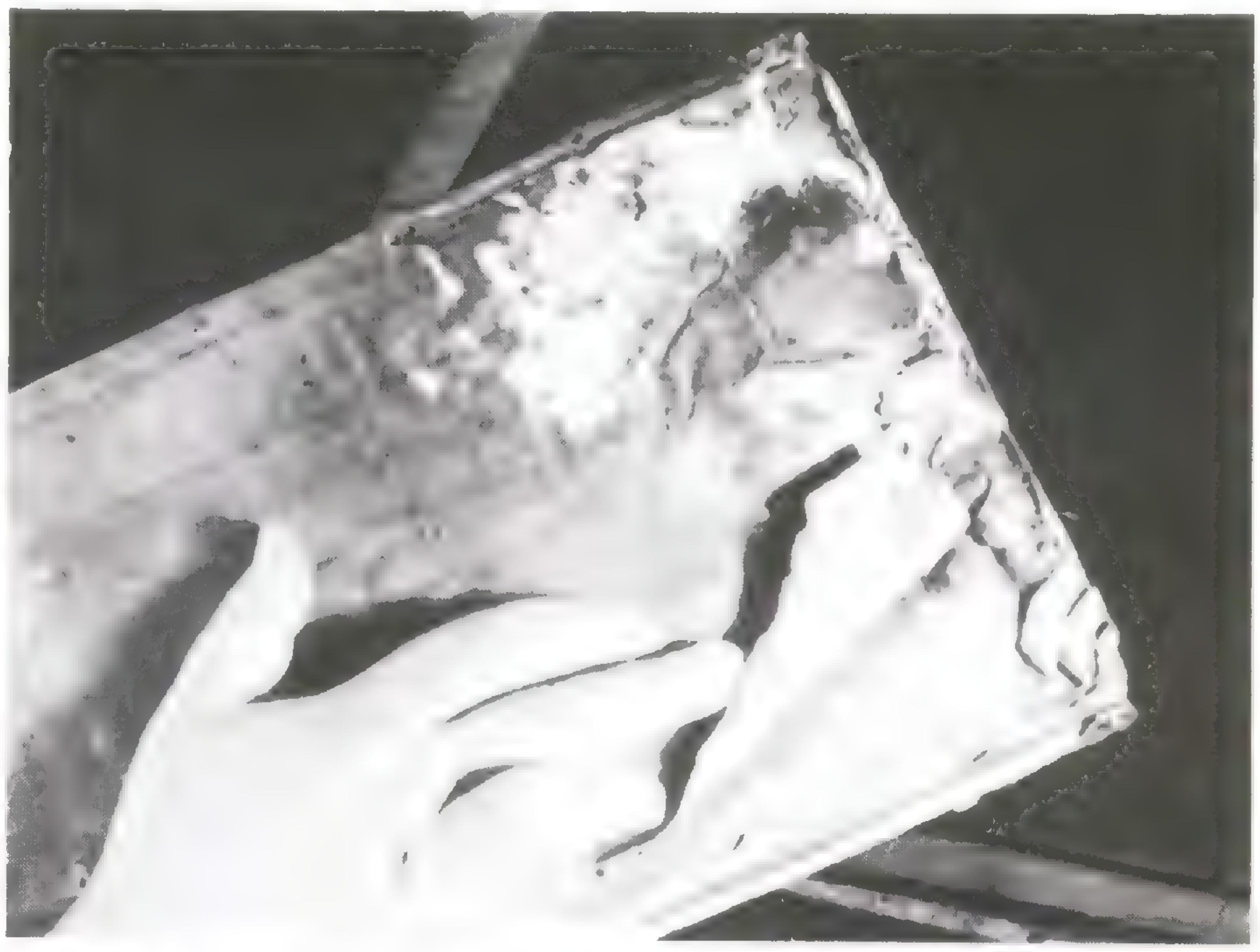
Dr. Went left the Garden in 1963; there followed a period in which Henry Hitchcock, as President of the Board of Trustees, acted as Director.

In 1965 David M. Gates came to the Garden as Director. Dr. Gates made a number of contributions to the scientific effort here, and to the aesthetics and physical plant of the garden. In 1968, he persuaded the Board of Trustees to undertake the very successful Capital Fund Drive of 1969, the first public fund drive in the history of the Garden. This drive was very successful, with $3.3 million raised in the St. Louis Community and an additional $600,000 grant from the National Science Foundation. The Drive made possible the construction of the beautiful new John S. Lehmann Building in which the Garden's research activities, both its herbarium, collection of dried plants, and its library are housed, as well as its educational program. The successful completion of the Capital Fund Drive and the construction of the John S. Lehmann Building has brought the Garden to a new level of achievement from which we can depart and on which our future plans can be based.

In its Missouri Botanical Garden, St. Louis has one of the finest botanical gardens to be found anywhere in the World. The task facing the Board of Trustees, the staff of the Garden, and the people of St. Louis is how to make it the finest.

THE GARDEN IS AN INSTITUTION IN WHICH THE PACE IS CONTINUOUSLY ACCELERATING AND WE'VE HAD A NUMBER OF EXCITING EVENTS IN THE LAST YEAR AND A HALF.

One of the most exciting was the dedication of the John S. Lehmann Building on May 12. Dr. H. Guyford Stever, the Director of the National Science Foundation, addressed us on that momentous occasion, and it signalled, really, the start of a new era for the Garden. The herbarium and library have now moved in, and we are settling into our permanent working phase. Our 2.2 million dried plant specimens are now stored in the most modern herbarium in the world — there is enough space to shelve the entire collection in the Garden's library — and our priceless rare book collection is being restored in the new bindery.



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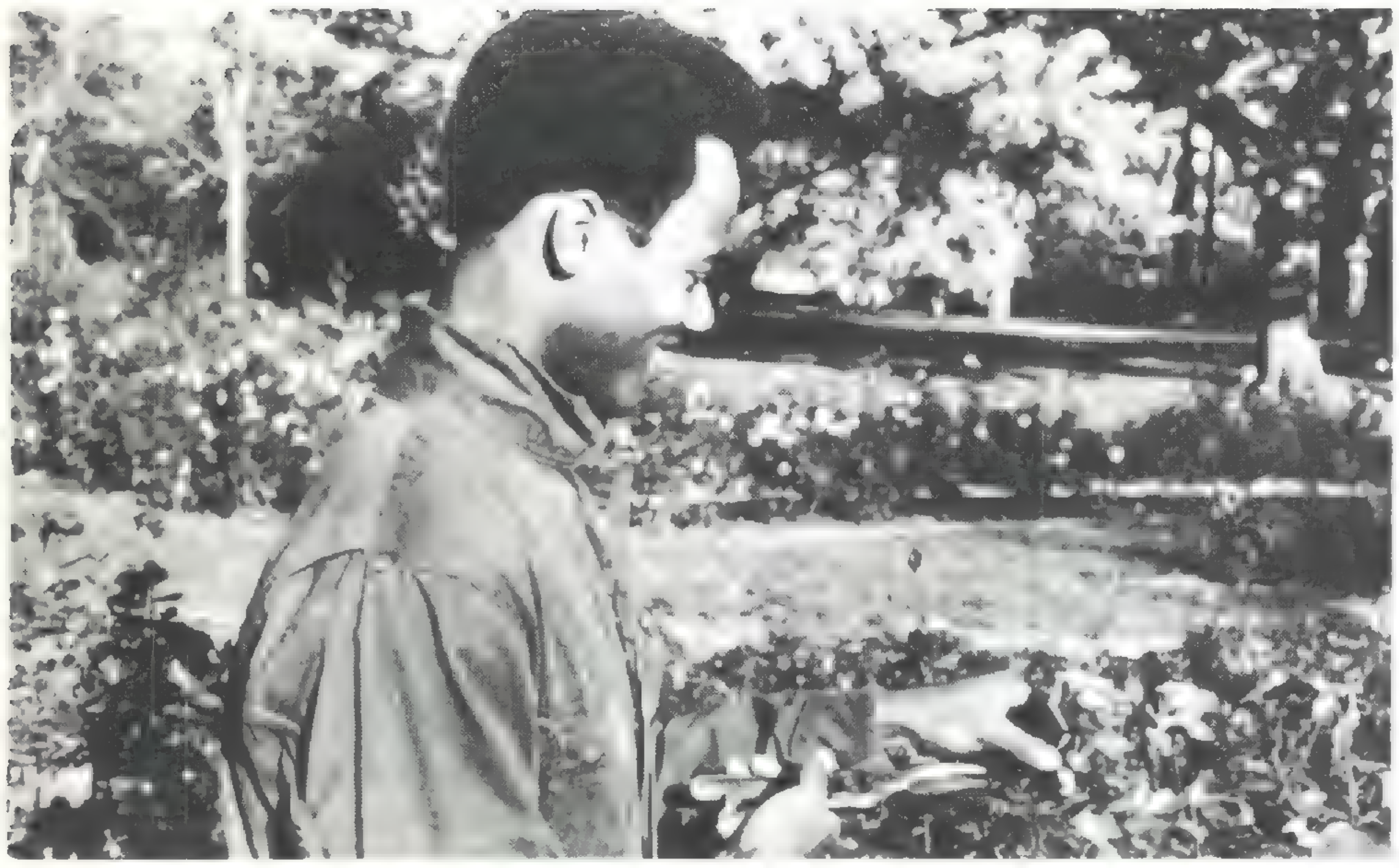
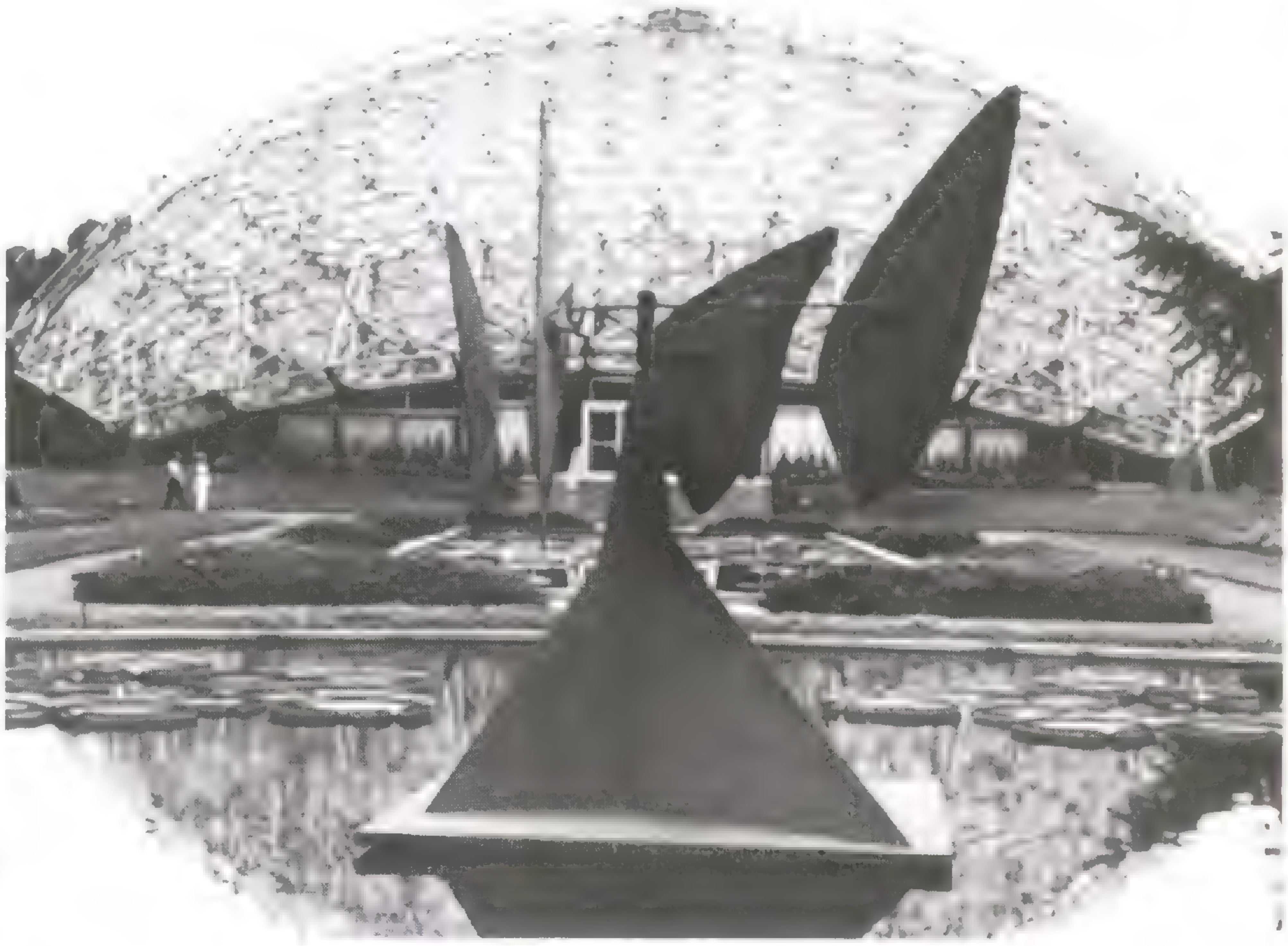


As a result of the move into the new building, and new emphasis in the education programs, the enrollment of children in our classes has apparently doubled. Educational opportunities include plant science lessons and workshops, work-study programs, adult continuing education, and guided tours.

THE ARBORETUM
& NATURE RESERVE
EXTENSION OF THE
MISSOURI BOTANICAL GARDEN

The Arboretum — 2200 acres at Gray Summit — was dedicated as a National Environmental Education Landmark by Secretary of the Interior Rogers C. B. Morton in October.

One exciting event of 1972 was the Spring Sculpture Festival, which was made possible by an allocation from the Missouri State Council on the Arts, and a grant from the National Endowment for the Arts. During the Festival, the Saint Louis Symphony Orchestra performed at the Garden. It's hard to imagine the Symphony playing in a more beautiful setting than the bowl south of the Climatron.



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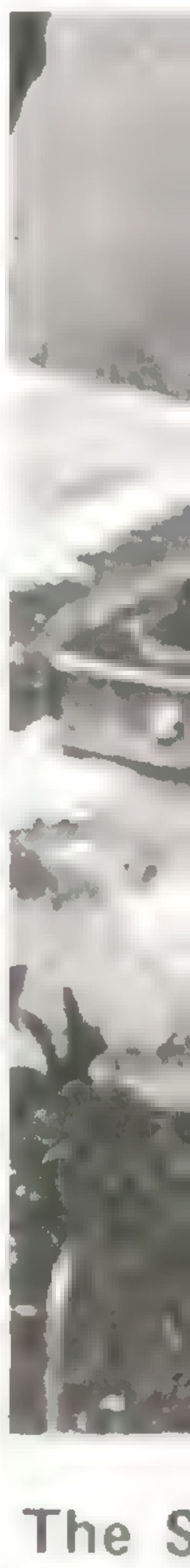

The S
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any cooperative ventures with other cultural
ecorated the fountain at the St. Louis Art
beds at the Zoo — the St. Louis Zoo brought
den for the Member's children's party.

Shop was enlarged, and through the efforts
ng volunteer committee, the amount con-
of Garden activities from Shop profits has
ally.

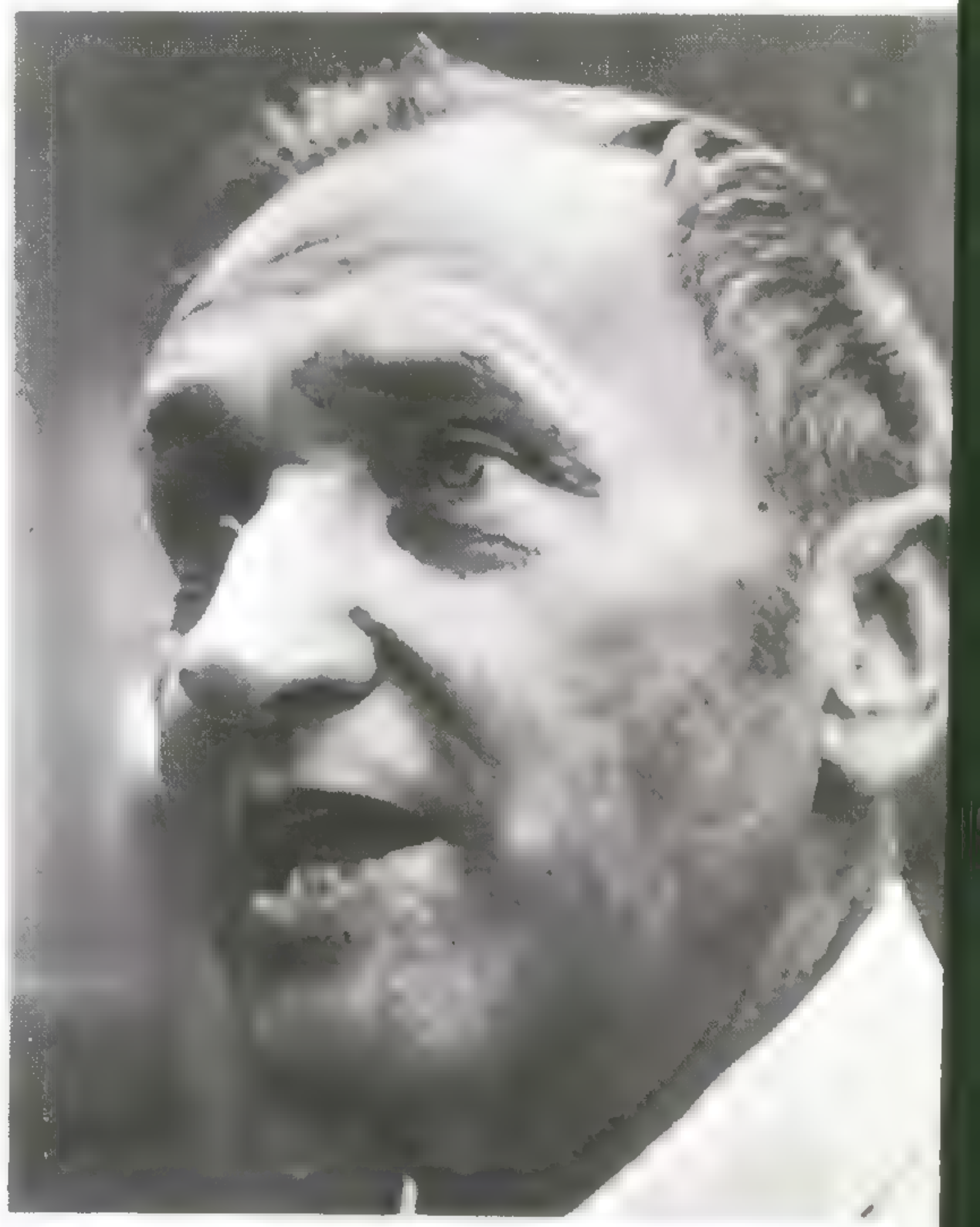
n for the Blind, a gift of Mrs. Eugene F.
mory of her mother and grandmother, was
ost-Dispatch photo by Lester Linck

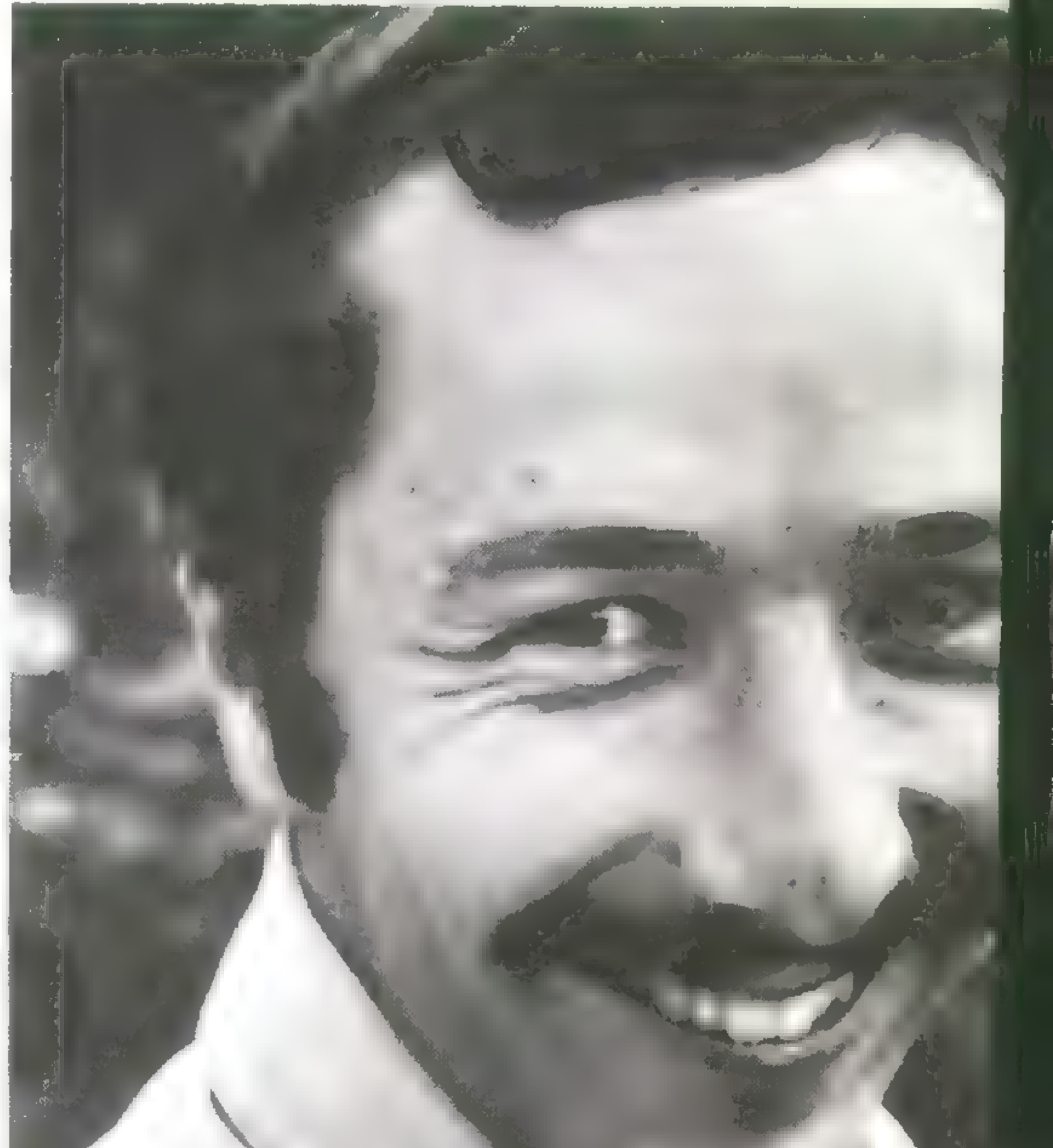
It would be impossible to accomplish the many activities of the Garden without the support of our wonderful volunteers and Members.

Another highlight was the 19th annual Systematics Symposium at the Garden. 300 scientists and graduate students, including delegates from ten countries in Latin America attended. Dr. Gerrit Davidse, left, a new staff member, was in charge of local arrangements.

FLORA NORTH AMERICA
COMMITTEE MEMBERS
ADMINISTRATIVE OFFICERS

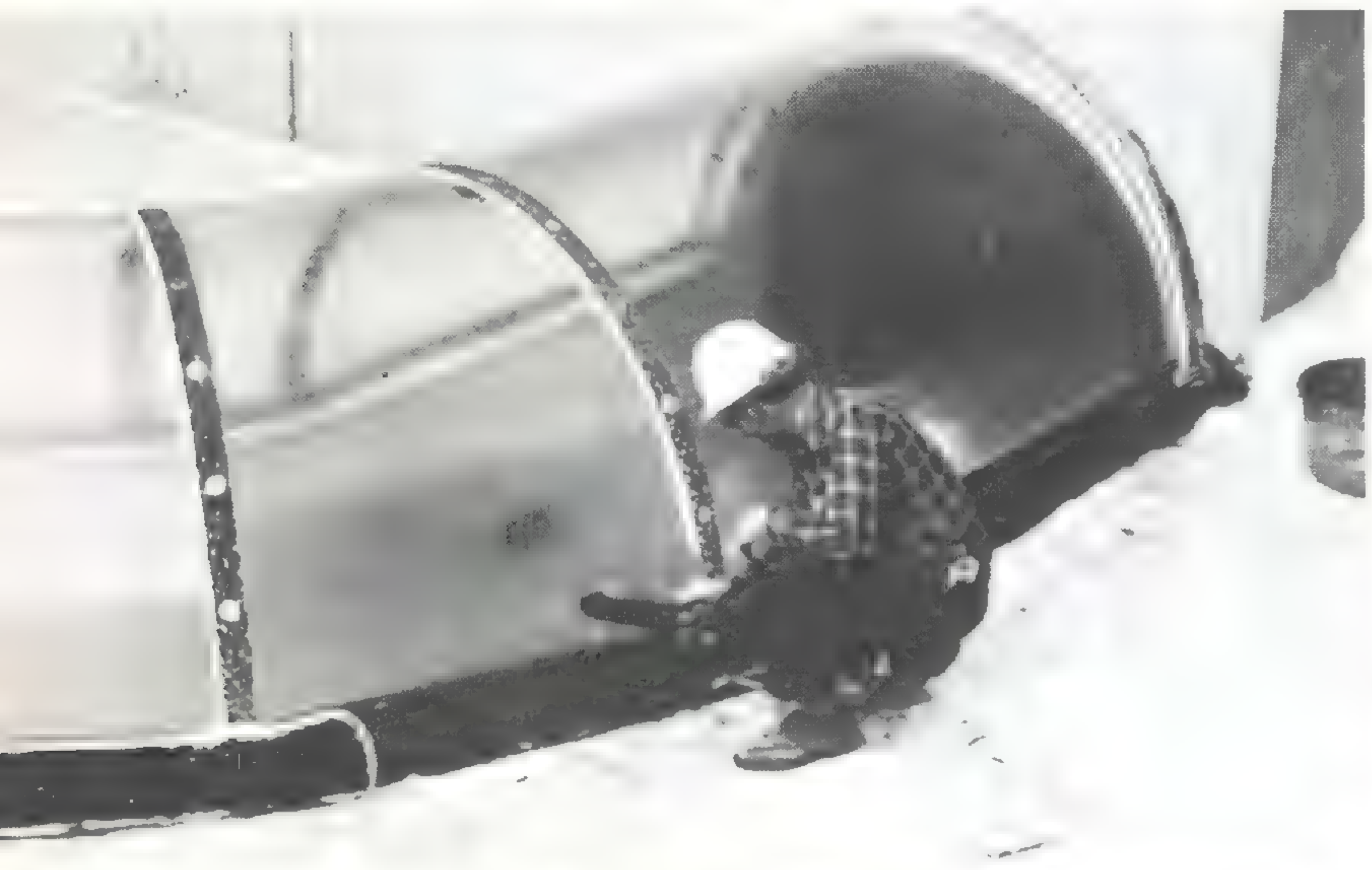
One of the developments of the last few months signalling potential for the future was the initiation of a new master for the Garden. The plan will concern itself not only with overall physical layout of the entire Garden, but also the wa which the general layout can be used to convey a message to public. Pictured are Geoffrey Rausch of Environmental Plan and Design of Pittsburgh, and Robert Dingwall, Chief H culturist.





The Garden staff is a blending of old faces and new faces. Paul Brockmann (left); James Reed (above), the new Librarian; Lad Cutak (upper right); Dave Goudy, Arboretum Supt.

new projects were undertaken by the horticulture depart- The Climatron was replanted, birds and butterflies were uced, and the pool remodelled to allow a greater variety of plants to grow there.



Gardening in St. Louis

Now is the time to send away for your favorite seed catalog. Send seed orders in early once you have planned your garden for the coming growing season. If plans call for new evergreens, trees or shrubs, get nurseries' catalogs and order early. State size of plant you want and buy good quality.

Resolve to keep accurate records of your garden for the new year and besides growing the old favorites, try some new varieties which we highly recommend — maybe some you have seen at the Garden's trial beds this past year.

In the greenhouse, improved growth will soon be noticed with the longer days and better light. Great care is needed in watering so as not to over-water plants on cloudy days. Watch temperatures carefully. Space plants according to growth so as to avoid crowding.

Bulbs for forcing into early bloom that were planted earlier and placed in cold frames or pots may now be brought indoors in successive batches. Place in cool temperature first and keep dark until growth becomes active; then give full light.

House plants need special care due to poor growth due to lack of light and dry atmospheres. Place plants on trays containing pebbles, sand or moss and water, so as to give extra humidity to plants. Syringe foliage daily with warm water and give all light possible. Prune leggy growth back and avoid fertilizer until plants resume normal growth.

Branches of Forsythias, Apples, Pussy Willow and Quince may now be brought indoors for forcing. Place stems in warm water and spray stems daily with warm water until color shows. In no time, they will be in full bloom, giving a foretaste of spring.

This is a good time to start Gloxinia bulbs, Amaryllis and Begonias for early spring bloom.

Christmas plants need plenty of light. Keep cool and moist, as needed, and avoid direct drafts, especially on Poinsettias.

Wood ashes from the fireplace should be stored in dry containers in the garage or basement, then applied to the garden in early spring — a good source of potash.

Avoid using salt on icy walkways or drives, as this will harm lawn and plants. Instead, use sand, or even wood ashes. Fertilizer will also work, but may harm the concrete walk.

A few sources of unusual plants are the following:

Brimfield Gardens Nursery
245 Brimfield Road
Wethersfield, Connecticut 06109
(Catalog $1.00)

Burgess Seed & Plant Company
Post Office Box 218
Galesburg, Michigan 49053

Joseph J. Kern Rose Nursery
Box 33
Mentor, Ohio 44060

Slocum Water Gardens
1101 Cypress Gardens Road
Winter Haven, Florida 33880
($.25)

W. Attlee Burpee Company
Hunting Park at 18th
Philadelphia, Pennsylvania 19132

Geo. W. Park Seed Company
Greenwood
South Carolina 29646

Rex Bulb Farms
Box 145
Newberry, Oregon 97132
($.50)

BOTANY — A SMALL DOSE

The common names of plants are often more colorful than the plants themselves, with additions being added as the ages pass. We all prefer to give names to the objects in our surroundings, and speculation as to how the common names of plants evolved indulges the whimsical fancy of everyone, more especially botany and horticulture students who often relieve long hours of study by tossing around wild guesses as to the origin of common names of plants. Take, for example, the gaillardia. We might conjecture that the ancestor of all aesthetics spied this bright, cheerful daisy and exclaimed, "What a glad flower!" His companion, the original name-dropper, with elaborate casualness, spread the word that this was indeed The Glad Flower. A century or so later, the flower, being vigorous of habit, had spread widely, and the first dissenter appeared on the scene. Surveying the invasion the flower had made into his vegetable plot, he growled, "This Glad Flower covers my field like a blanket". Thereupon, in those parts, Glad Flower became Blanket Flower — until, that is, the pretty posy became an edging for the path Dissenter took when (sad to relate) he came reeling home to his anxious wife. Ever-constant, his wife renamed the flower "Come-Home-Husband-Be-He-

Ever-So-Drunk '* How a name such as this could ever become *common* is difficult to understand, but, as you can see, the botanists had to step in at this point. We can be grateful to Linneaeus, who succeeded in standardizing classification schemes and gave us a basis for plant classification.

Beginning with the Plant Kingdom and proceeding through Class, Order, Family, Genus, Species and Variety, the whole structure assumes, on paper, a tree-like form that eventually assumes the density of a thicket, especially at the varietal level where horticulturists entered to add apt, but often undignified names to the already lengthy framework, e.g. Snubby Nose, Twinkle Toes. In addition, the geneticist's records, which thankfully are not included in general gardening catalogs, contain long lists of combinations of these varietal names, making one wonder if we aren't in danger of reverting back to the be-he-ever-so-drunk thing.

What brought all this on? Your questions, that come into the Botany or Horticulture departments of the Garden by phone or in person. A case in point: A Member called recently to ask how she should water her Chocolate Soldier plant. Though we knew the name she had given referred to a variety name, we couldn't for the life of us recall the genus and species of a plant that included a variety "Chocolate Soldier." While racking our collective brains, we asked if she had kept the plant's tag. "Oh, yes," she said, "but it doesn't make sense."

She found the tag, however, and though the species name was rubbed out, the words she spelled out caused the plant to fall into a slot. The tag read, 'E._________ Chocolate Soldier, gesneriad.' The E. refers to the genus Episcia of the variety Chocolate Soldier, and the clincher is *gesneriad,* a botanical contraction for the Gesneriaceae (jes-neer-ee-A-see-ee) family of about one hundred genera and eight hundred species, notable for the house plants Saintpaulia (African violet), and Sinningia (gloxinia), and now, more commonly, Episcia. Even though not one of us remembers personal experience in growing this particular variety, a category of culture can be followed for the entire genus, and in some cases, an entire family; thus we were able to answer the questions as to watering Chocolate Soldier.

This incident is one of many, a veritable parade of problems posed by callers who need an assist in their gardening problems. For many of these persons, the time is ripe for adding to their gardening knowledge by undertaking a short course in botany. Last year, and again this year, the Garden is offering a short course that gives enough botanical information so that gardeners can determine the *category of culture* for themselves, and in the process become better gardeners. The course is called "Botany for People" and will be held weekly in the Lehmann Building on Thursdays from January 18 through February 22 from 10 a.m. until 11:30 a.m. Topics include: major groups of plants, plant structure, flower structure and pollination, and other subjects that will dip deeply enough into botany to enable you, the gardener, to ferret out answers to cultural questions that have heretofore remained hidden to you.

*From a list of common plant names for *Gaillardia lutea* in "A Journal of Plante Life," author unknown, owned by Harvey M. Tupper, M.D., Grand Junction, Colorado.

SCULPTURE SHOW IN CLIMATRON

An exhibit of twenty-five sculptures by Elizabeth Phelan will be held in the Climatron at the Garden through January 21.

The works will be displayed among the tropical plantings within the geodesic dome, and there is a natural affinity between the art of Miss Phelan and the art of nature. Her subjects are animals and plant forms, some abstract, some primitive. They are executed in limestone, sandstone, and woods: teak, walnut, redwood, and applewood. Possibly this affinity comes from her childhood: she lived on a tropical coffee plantation in the state of Vera Cruz, Mexico, until she was thirteen years old.

In the late thirties, she took lessons in clay modeling, but disliked this way of making sculpture and, with no instruction, began stone and wood carving — the mallet and chisels did the teaching.

Miss Phelan has exhibited in many national, regional, and local shows. She has had six one-man shows in St. Louis, and was one of three Missouri Sculptors invited to exhibit at the New York City World's Fair in 1964.

The Missouri Botanical Garden is a
Fund Member of the
Arts and Education Council of Greater St. Louis

The Bulletin is published 9 issues per year, bi-monthly in January-February, March-April, May-June, and monthly from July to December, by the Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Mo. 63110. Second class postage paid at St. Louis, Mo.

CALENDAR OF EVENTS

Special Events

Month of January	Elizabeth Phelan Sculpture Exhibit in Climatron
January 1 through January 14	Christmas Flower Show Floral Display House
January 19	Horticulture Lecture "Dish Gardens and Terrariums" Growing Center — 10:30 a.m.
January 31 First in a Series of Botany Lectures	Botany Lecture Speaker: Dr. Richard E. Schultes Harvard University Lehmann Building Auditorium — 8:00 p.m.
February 2	Orchid Show Preview Party Climatron — 5:30-7:30 p.m.
February 3 through March 21	Orchid Show Climatron
February 16	Horticulture Lecture "Garden Design" Growing Center — 10:30 a.m.

Adult Classes (Reservation Only)

January 18, 25 February 1, 8, 15, 22	"Botany for People" Instructor: Kenneth Peck Lehmann Building — 10-11:30 a. Fee: $18; Members $14
	"The Tropical Terrarium" Instructor: Sandra Thornton Lehmann Building Fee: $12; Members $10
January 25	Section A 7:30 p.m. - 10:00 p.m.
January 31	Section B 10:00 a.m. - 2:00 p.m.
February 14	Section C 10:00 a.m. - 2:00 p.m.

Children's Classes	Lehmann Building 10:00 - 11:30 a.m.
January 13	"Table Top Greenhouses" Fee: $.50 (Bring a 1 lb. coffee container and plastic bag large enough to cover)
January 27	"Cold Desert and High Plateau" Fee: $.25
February 10	"Mystery of the Orchid" Fee: $.25

HIDDEN TREES –

Here are the hidden trees.

We went to the woods the other day to see the trees in their autumn color. The colors were overwh*elm*ingly bright. Some trees even had brightly col*ored bud*s. We met the b*lind En*glishman, whose fa*ce dar*kened *as he* heard our footsteps at some distance for he has very shar*p ears*. He was a preacher in a very popu*lar ch*urch when his trouble began. His daughter, Lu*cy press*ed him to see an oculist and ma*ma ple*aded with him, but in vain. He re*pine*s constantly and grows grayer and b*alder.* He has made his *will ow*ing to his ill health, and has made t*hem lock* up all his books. Ho*pe can* keep one up under affliction, but he has no *hop*e and the poor man, who has been as busy as a *bee ch*atting pleasantly with every one, has become morose and taciturn and sunk int*o a k*ind of lethargy.

MISSOURI BOTANICAL GARDEN BULLETIN
2315 Tower Grove Avenue
Saint Louis, Missouri 63110

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Missouri Botanical Garden Bulletin

ANNUAL ORCHID SHOW IN CLIMATRON WINTER HIGHLIGHT at the GARDEN

The 1973 Orchid Show at the Missouri Botanical Garden opens February 3 in the Climatron. The Garden's collection of more than twenty-five hundred plants will be displayed in various ways amid the natural background of the tropical plantings. Orchids will be hung in trees and tucked along the curving paths. Many very rare plants are included in this show.

Orchids have always been in the Garden's collection of plants. In the late 1870's, Mrs. Henry T. Blow presented Mr. Henry Shaw with a small collection of Brazilian orchids. In 1906, Mr. George H. Pring came to the Garden from the Royal Botanic Gardens at Kew, England, to take charge of the orchid collection. The number of plants had increased over the years, and by 1913, the collection contained eight hundred species and varieties. Five years later, Mr. D. S. Brown of Kirkwood donated his entire collection, which included many lady slipper orchids – his favorite – to the Garden.

Mr. Pring conducted an expedition to collect the plants in Panama, Colombia, and the West Indies in the spring of 1923. On his way home, he stopped in Balboa, Canal Zone, to visit the famous Garden of Mr. C. W. Powell. Later, Mr. Powell shipped plants to the Garden from his collection, adding materially to the number of botanical species.

Divisions of some of these plants, which were added to the collection in the early part of the Twentieth Century, appear in the show in the Climatron. These particular plants are an important part of the present collection, since many of them are now extinct in their native habitat.

The orchid collection is continually being revised, and the value increases over the years. The Cymbidium collection has been updated during the past year – twenty new cultivars were purchased through a special donation for this purpose. Approximately fifty new species were added through exchanges or donations. The Garden hopes to add species of orchids to encompass many of the types which are becoming extinct or very scarce. Exchanges and donations come from collectors in the field. On a recent trip to Hong Kong, Chief Horticulturist Robert Dingwall was offered a complete depository of the twenty-eight recognized native orchids found there. These are being transmitted over a period of two years.

In the early years, the orchids were displayed in one of the small greenhouses. The 1973 show will continue in the Climatron through March 20. Members of the Garden attended a preview of the Show on Friday, February 2, which was made possible through the generosity of Famous-Barr. ☐

Volume LXII Number 1
February, 1973

Globe-Democrat Photo

MRS. JOHN S. LEHMANN – A 1972 WOMAN OF ACHIEVEMENT

Mrs. John S. Lehmann was one of ten 1972 Globe-Democrat Women of Achievement honored on January 15, 1973, at a luncheon in the Khorassan Room of the Chase-Park Plaza Hotel. In the photograph above, G. Duncan Bauman, Publisher of the Globe-Democrat, is shown presenting Mrs. Lehmann with a plate given in honor of this very appropriate award. Our congratulations also go to Mrs. Lehmann on the occasion of this fitting tribute.

The Globe-Democrat citation, prepared in connection with the Woman of Achievement award, reads as follows:

"It is with deep pride that Mrs. John S. Lehmann looks at the name over a beautiful new building on the grounds of the Missouri Botanical (Shaw's) Garden. The name is John S. Lehmann and the building is a tribute to her husband and to his many years of devoted service to Shaw's Garden.

"The former Anne Shepley Lionberger, Mrs. Lehmann grew up in St. Louis, attended Mary Institute and a finishing school in the East before marrying in 1925. Her husband was born in Iowa but had come to St. Louis in the early 1900's. Together, they took special courses at Shaw's Garden, sharing a love of plants, and when Mr. Lehmann went on the Garden Board, his wife's interest in the world-renowned Garden deepened.

"She was a co-founder of the Garden's Women's Committee, was instrumental in the restoration of Tower Grove House, and still is active on the Historical Committee. She also has served on the board of the Women's Society of Washington University and is a member of the Psychiatric Research Foundation. Yet it is Shaw's Garden which remains particularly close to her heart as she continues the heritage of civic philanthropy she shared with her husband." ☐

ELECTION OF NEW BOARD OFFICERS

The Board of Trustees of the Missouri Botanical Garden held its annual meeting January 17, 1973, and elected new officers for the year.

Joseph H. Bascom was named president. Mr. Bascom first became a member of the Board in 1971, and has taken an active role in Garden affairs since that time. In 1972, he served as second vice president. Mr. Bascom is chairman of the board of Broderick and Bascom Rope Company, a subsidiary of Keystone Consolidated Industries. He is also a member of the boards of directors of General Steel Industries, St. Louis Union Trust Co., Mississippi River Corporation, and Missouri Historical Society. Mr. Bascom becomes president of our Board at a time when the Master Plan promises significant new developments at the Garden, and the coming year should hold as much in store as other years of the recent past.

Tom K. Smith, Jr., was re-elected first vice president of the Board of Trustees. He first became a member of the Board in 1963. Mr. Smith is managing director of Monsanto Commercial Products Company, an operating unit of Monsanto Company, and is a corporate vice president and member of the board of directors. He is a board member of the Arts and Education Council, Loretto Hilton Theater, and St. Louis Symphony Society, and has been active in recent years in fund-raising for the United Fund and the Arts and Education Council. He has served as a trustee of St. Louis Country Day School.

A. Timon Primm, III, was elected second vice president. After graduating from Yale University in 1936, Mr. Primm went to work for the St. Louis Post Dispatch, where he is now vice president and general manager of The Pulitzer Publishing Company. He became a member of the Garden's Board of Trustees in 1964, and has been active in the Garden itself and especially in the development of the Arboretum. Mr. Primm is vitally interested in issues of conservation and ecology, and active in the Nature Conservancy. ☐

New Board officers: A. Timon Primm, second vice president (left); Joseph H. Bascom, president (center); and Tom K. Smith, Jr., first vice president (right).

C. POWELL WHITEHEAD
Board President 1970-1972

We salute Charles Powell Whitehead upon the completion of his term as president of the Board of Trustees of the Missouri Botanical Garden. Mr. Whitehead joined the Board in 1965, bringing to it his great vitality and enthusiasm for civic causes. He played a most important role in the 1969 Capital Fund Drive, in which $3.9 million was raised in the first such drive in the Garden's history. These funds subsequently made possible the construction of the magnificent, modern John S. Lehmann Building, dedicated in May, 1972, which now houses the Garden's herbarium and library, among the finest in the world.

Mr. Whitehead has served as president of the Board of Trustees for three years, 1970-1972. During this period, many exciting new developments have occurred, holding great promise for the future. Mr. Whitehead will continue as a member of the Board, and we hope to have the benefit of his counsel for many years to come.

Although the Garden is the most recent of Mr. Whitehead's enthusiasms, it is only one of many institutions and activities in the St. Louis area that he has helped. For many years he played an active role in United Fund Drives, serving as general chairman in 1956 and president in 1964. In 1967, he served with Maurice R. Chambers as co-chairman of the joint campaign which raised $777,700 for the Arts and Education Fund and $4 million for the Symphony Development Fund, which made possible the purchase and renovation of Powell Hall. Among the other organizations which he has served so well are the Boy Scouts, YMCA, Municipal Opera, Chamber of Commerce, St. Elizabeth's Hospital in Granite City, Junior Achievement, and Washington, St. Louis, and Princeton Universities.

C. Powell Whitehead was employed by General Steel Industries for 45 years, serving as president for the 19 years prior to his retirement in 1964. During the period of his presidency, the Company's sales tripled, and both Mr. Whitehead personally and the Company consistently made strong contributions to the welfare of the communities in which it was located. Mr. Whitehead lives with his wife of nearly 55 years, the former Georgia Zeibig, in a Colonial-style home on Wydown Terrace in Clayton. He received the annual Brotherhood Award of the National Conference of Christians and Jews in 1966 for distinguished service to the community and to mankind, and was named the Globe-Democrat Man of the Year in December, 1968. We thank him for all he has done for the Garden, and wish him and his wife every happiness in the years to come. □

REPLANTING IN LINNAEAN HOUSE CAMELLIA COLLECTION EXPANDED

During the past six weeks, a major change has taken place in the Linnaean House — the charming brick greenhouse in the northern part of the Garden which houses the Camellia collection. Though the old plantings featured one hundred fifteen plants of forty cultivars, many were duplicates and of very poor flowering quality. The poor plants have been removed, the soil has been completely reworked by adding humus, and the pH of the soil has been adjusted.

Twenty-one new cultivars of Camellias have been added, along with ten rhododendron species or cultivars. These plants vary in size and many will flower in the next few months. Four to five hundred primroses of several species along with several varieties of heather to add color and interest have been planted. Long range plans call for adding more camellias in the fall, and more exotic rhododendrons, so that in two years the Linnaean House will feature a very spectacular display of flowering material.

The color of blooms ranges from white through deep red; many of the newer plants bloom in midseason, so that the beauty of the blooms last through the long, gray St. Louis winter. New varieties included in the planting are Julia Wilson, Kona, Rosemary Kinser, Marc Eleven, Mathotiana Supreme, and new species are *Camellia fraterna* and *C. oleifera.* Most St. Louisans have not had the opportunity to see these particular plants before.

The Linnaean House, built by Henry Shaw in 1882, is the oldest continuously operated greenhouse west of the Mississippi River. "The replanting in this house is one of a number of collections being updated at the Garden. We are particularly anxious to build up the interest in this area of the Garden and are diversifying these collections," said Robert Dingwall, Chief Horticulturist. □

Gardening in St. Louis

FEBRUARY

Tulips and other spring bulbs placed in storage to root may be forced quickly now. Easter lilies can also be brought along in a sunny window.

Keep cacti and succulent plants in the house in a bright, sunny window. Poor drainage in the pots and overwatering may encourage disease.

Remember that leaves of plants breathe, so broad leaves, such as on rubber trees, scheffleras and dracaenas should be wiped with a soft cloth occasionally, using water that is warm to the touch. Other small-leaved plants benefit from spraying. Plants may be placed on their side in the bathtub to do this.

Continue to cut and force branches of flowering shrubs for indoor color. Branches of pussy willows can be forced readily.

Seeds of annuals that are slow to come into flower, such as begonias, dahlias, carnations and others, should be sown now. Sow seed in a good, open, sandy soil and cover with glass to hold humidity, but open a little each day for good air circulation.

House plants need extra attention. Be sure air is moist, give plenty of light, water as needed, and wash frequently to remove dust, lice and scale. Give plants regular feedings of liquid fertilizer at two-week intervals.

Gloxinias may be started for summer color. Remember, do not keep too wet until growth is active; give good light, but not too much direct sun.

Dormant oil should be applied to outdoor trees and shrubs as soon as there is no danger of temperatures below 45° for at least two hours after application. Do not use lime sulphur or any other combinations with this, as they are not necessary. Prune trees and late summer shrubs on mild days now to reshape plants and open them up to more light. Height of fruit trees can be controlled by careful pruning. Check trunks of trees for mice or rabbit damage. Prepare to have large trees or shrubs moved before the busy spring schedule starts.

Order new shrubs and trees early for pick-up or delivery.

Continue to put out seed for the birds and see that water is available nearby. Remember that chickadees, nuthatches and others consume large quantities of insect eggs and larvae from the tree trunks in your area, thus reducing the infestation later on.

During mild days, make the rounds of the garden, pressing back into place plants thrown out with the frost, so as to avoid having them dry out.

A satisfactory soil for seed starting is one made of equal parts of clean sand, good loam and a humus material such as peat moss. Many people use straight sphagnum moss, screened through a fine mesh as it prevents damping off. A one-inch layer of soil over the seed is sufficient.

This is your last chance to get garden tools cleaned and repaired for use next month. Avoid last minute rush.

Visit the Garden regularly for ideas and plan to attend the March Workshop for ideas to improve your own home garden this spring. ☐

ORCHIDS ARE FOR THE HOME!

Orchids are much more than the top word in glamour for gala occasions. Orchids are for the home! Out of bloom, orchid plants lend to the 'atmosphere extraordinaire'; while orchid plants in bloom are the epitome of that exotic note that converts a room to one that is a cut above the common plane. The blooms may last for weeks if allowed to remain on the plant, or, if cut, they can become the focal point for striking and different arrangements; such as, a centerpiece of lacy fern and soft white Phalaenopsis for a bridal luncheon, or a symbolic piece denoting youth and age for a fiftieth wedding anniversary, using weathered wood and a single, perfect, deep purple Cattleya.

Orchids have *arrived* as a new challenge, particularly to the Middle Westerner, as something different to be grown and flowered in the home or home greenhouse. This trend places another responsibility on the Missouri Botanical Garden — that of supplying information on the culture of orchids. Before we proceed into culture methods, we must be reminded that orchids range into almost every part of the globe, even to such illogical spots as the chill, bleak meadows of Patagonia, the often frigid dales of Alaska, the snow-covered summits of the Himalayas, the parched, sandy deserts of Australia and Africa, and as semi-aquatic plants in the tannin-stained streams of our own Southeastern states. They are most often found in trees, but often on rocks, growing as epiphytes; that is, receiving support but not taking nutriment from the plant or rock upon which they rest. In their native habitat, they receive moderate to intense amounts of sun, and temperatures vary, with a medium range for most being 50° to 60°F. at night and 66° to 85° during the day. Precipitation, in the form of rain, occurs as heavy thunderstorms which momentarily drench the plant, but run off quickly so that the plant is never subjected to long periods of inundation. Relative humidity varies for each genus and species in their native habitat, but in the home, 50% or above is the range accepted by most species.

In trying to duplicate the orchid's environmental conditions, our experience has indicated that most species can grow and flower if one environmental factor is not up to optimum. However, if two or more factors are not at optimum, your plant will have a real struggle to survive. We submit the following as a resumé of the how-to, how-come and what-for of orchid culture:

SUGGESTED GROWING PROCEDURE

LOCATION:

A sunny window, either east, west or south, where the night temperature next to the window falls into the 60° range in the winter. In the summer, most orchids benefit from being hung outside under a tree or in a lath house so that they can receive some direct morning or late afternoon sun, or both, if possible.

EQUIPMENT:

A flat glass, metal, or crockery tray containing an inch of gravel or decorative stones on which the plant can be placed. Keep the stones or gravel moist at all times. This will help maintain higher humidity around the plant. Make sure the plant does not become saturated from contact with the moist gravel, but if this happens, invert a pot saucer to hold the orchid pot above the moisture, or devise a platform of stiff hardware mesh to hold the pot.

WATERING:

Orchids like to be soaked and then allowed to dry out *slightly* before being watered again. Here in the Midwest, particularly during our scorching, dry summers, proportioning the correct amount of water for orchids is probably the most asked-about problem. Throughout this central belt, we find that the need for water at the roots is best supplied by keeping the potting material *medium* moist at all times. With a little experience you will soon learn how much is required in your own particular home or summer-out-of-doors situation. To generalize, a good soaking two or three times a week, either by submerging the entire pot or by overhead watering, should supply the average plant with enough water, but we cannot over-emphasize that generalities often do not apply and you should check the potting media daily until you are familiar with the individual needs of the plant. If your plants stay indoors and under air-conditioning during the summer, the water requirements will vary according to the efficiency of the air-conditioning system.

POTTING AND DIVIDING:

While orchid potting and dividing is not difficult to learn, the when-to-repot and where-to-divide are just as important as the act itself. If you've had no experience in orchid potting, we suggest that you give us a call, leaving your name and number so that we can let you know when the repotting operation will be going on at the Garden so that you can come in and watch. If there are enough persons calling in for this service, we will set up a demonstration workshop. Your plant needs repotting when it grows over the edge of the pot, and if you care to strike out on your own, consult one of the references listed below that have excellent pictures of step-by-step procedures.

FERTILIZING:

Orchids are usually slow growers, and, consequently, are weak feeders. Under home conditions, too much fertilizer can be worse than no fertilizer at all. A good fertilizing schedule to follow is: Apply any standard, commercial, water-soluble fertilizer once a month from April through October, at one-half the strength that is recommended for other house plants.

DISEASES AND PESTS:

Normally, orchids in good health remain remarkably free of disease and pests. Orchid scale (Boisduval's scale) is the most frequently encountered insect pest. This small, white insect collects in fluffy colonies under the leaves and at the base of the pseudobulbs. They can be easily brought under control by spraying with malathion at two teaspoonsful to one gallon of water. Diseases of all plants are caused by viruses, bacteria and fungi. As in any class of living things, some diseases are fatal, and some are not; some can be alleviated and some, thus far, have no cure. Plants, like people, may show individual resistance to certain diseases, or some may be more susceptible. Diseases caused by bacteria and fungi show up first as watery spots which become sunken and brown as the tissues in the area die. In contrast to a burn caused by too much light, the spots usually enlarge or become more numerous. A disease may start at the tip of the leaf, gradually spreading down the length of the leaf. Or, it may start in the rhizome, killing off pseudobulbs and leaves as it progresses. A few spots may appear and then become arrested if the plant is resistant, or if its spread is controlled. Soft, succulent growth is more easily attacked than growth that is hard and tough to the touch. Water on the leaf or sheath or pseudobulb is a partner to the spread of disease. Allowing the foliage to dry off after watering or syringing, and ventilating to assure an exchange of air and prevention of stagnation are important steps in disease prevention. Sanitation, cleaning up fallen flowers and plant parts that can harbor disease organisms are your best insurance against disease. If fungal or bacterial disease does strike, a good general fungicide containing fermate should be applied according to the directions on the package. Virus diseases are more elusive, but symptoms are similar to those already described, and since treatment with chemicals is, at best, chancy, try your hand at surgery — cutting out the diseased areas with a very sharp, clean knife. Cut well into the healthy parts to insure removal of unseen disease organisms; then dip the plant into a solution of fermate or smear the cut portions with a paste of fermate; this to guard entry of fungi into the injured parts. Keep the plant drier than normal for a week or two, and separate it from other plants. If, after this operation is completed, the plant continues to show symptoms of disease, it is best to discard it.

TROUBLE SHOOTING:

Orchids are among nature's most rugged plants, and consequently, they die slowly. A plant can be gradually dying and the untrained observer will frequently never be aware of it until it is too late. The following list of danger signals will enable you to know immediately when your plant is unhappy.

SYMPTOM	CAUSE	Rx
leaves crinkled and pseudobulbs shrivelled	insufficient water	step up watering schedule
very dark green leaves and no flowers	insufficient light	increase light intensity *gradually*
leaves turning yellow & falling off plant	excessive watering	reduce water
pot and potting media moss and/or slime covered	insufficient light & insufficient air circulation	increase light, and, *more important,* increase air circulation

Good books available at the Garden Gate Shop and the Growing Center are:

"Home Orchid Growing," by Rebecca T. Northen; D. Van Nostrand Co., Inc.

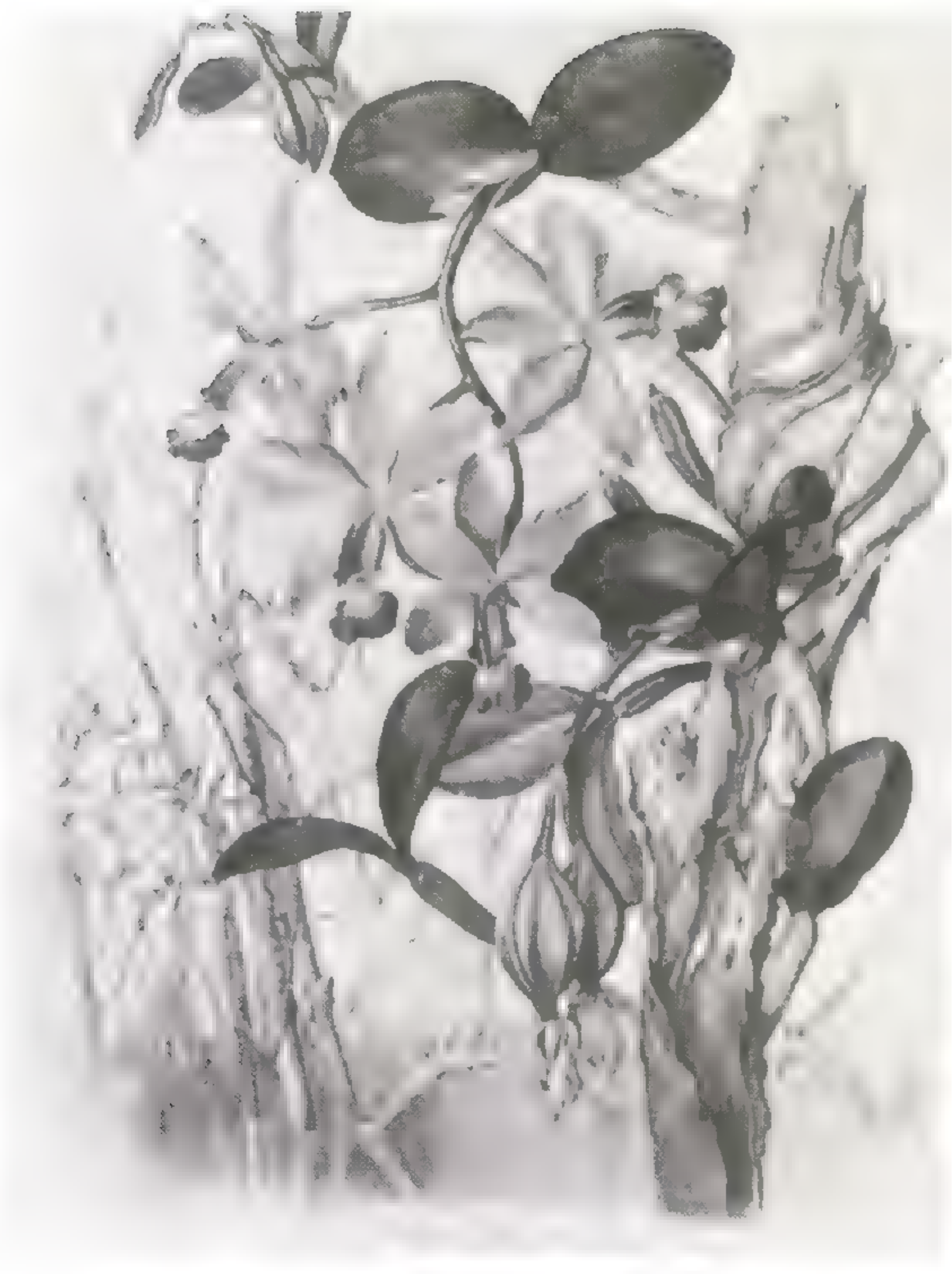
"How to Grow Orchids," a Sunset Book, Lane Books, Menlo, Calif.

"Orchids," a Brooklyn Botanic Garden book

"Orchids You Can Grow," by Harry Britton Logan, Hawthorne Books, Inc.

"Biology of the Orchid," by Dodson and Gillespie, Mid-America Orchid Congress, Inc. □

The MISSOURI BOTANICAL GARDEN BULLETIN is published 10 issues per year monthly except January and August, by the Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Mo. 63110. Second class postage paid at St. Louis, Mo.



DEATH OF MRS. EARL M. JOHNSTON

This lovely painting of a Brazilian orchid, which may be seen hanging in the John S. Lehmann Building at the Garden, was presented to us in December, 1972, by Mrs. Earl M. Johnston. Mrs. Johnston, life member and long-time devoted friend of the Garden, passed away on January 14, 1973. She had been a member of the first Women's Committee of the Garden, and active at the Garden for many years.

Mrs. Johnston was also an active painter, devoting most of her painting to flowers, many of which she raised in her garden at her home on Kingsbury Place. She was one of the talented women artists in the Studio Group, which painted under the direction of Fred Conway. During the summer of 1954 an exhibition of Mrs. Johnston's flower paintings was held in the Garden's Museum, and several of them were displayed at the dedication of the Lehmann Building in May, 1972.

Mrs. Johnston was a member of the Garden's January, 1969 tour of South America. During her visit to Rio de Janeiro, she met Margaret Mee, one of the world's better-known botanical artists. Since 1960, Mrs. Mee has made many expeditions into the Brazilian jungles to collect and paint on-the-spot portraits of the tropical flora. Her paintings have illustrated several important and beautiful books, including *Flowers of the Brazilian Forests* (1968).

After visiting Mrs. Mee and having the opportunity to see her work, Mrs. Johnston conceived the idea of commissioning a painting to hang in the Lehmann Building at the Garden. The resulting portrait of the striking *Cattleya violacea* was prepared in the summer of 1972 on the Rio Cuiuni, a tributary of the Alto Rio Negro in the Amazonian rainforest of Brazil. The artist has skillfully depicted it in its natural setting among the trees of that often-flooded plain. It is most appropriate in view of the Garden's long-standing interest in orchids and in the plants of South America. It will remind us all of a good friend. □

DANIEL L. SCHLAFLY RETURNS O THE BOARD OF TRUSTEES

Daniel L. Schlafly was returned to the Board of rustees of the Missouri Botanical Garden at the anuary 17 meeting of the Board. Mr. Schlafly had reviously been an ex-officio member in his capacity s President of the St. Louis Board of Education, a osition on the Board which is now held by Mrs. della T. Smiley.

Mr. Schlafly is a well known friend of education in t. Louis and has served as President of the Board of ducation for three terms. He received the St. Louis ward in 1960 "for his efforts to improve the quality f education in the City of St. Louis," and was a harter member of the Higher Education Coordinatng Council.

Currently he is Chairman of the Board of Trustees f St. Louis University, and has served in that apacity since 1967. Mr. Schlafly is also Chairman of he Board of Arkansas Beverage Co. He is a native St. ouisan, a graduate of St. Louis University High chool and Georgetown University (1933). He is narried to the former Adelaide Mahaffey and is the ather of three children. The Schlafly's reside at 7 Vestmoreland Place. ☐

LANTS VS. INSECTS – HE UNENDING WAR

Some plants have evolved a fascinating variety of nechanisms to discourage the attacks of leaf-eating nsects, whereas others have evolved scents and colors hat attract insects to their flowers so that cross-ollination will result. On February 28, Garden Direcor Peter H. Raven will illustrate some of these elationships in the auditorium of the Lehmann uilding at the Garden. The talk will be open to nembers and their guests, and seats can be reserved ither by mail or by telephoning Shirley Barnett at ne Garden, 865-0440. Ample parking is available in ne lot just south of the Administration Building at 315 Tower Grove Ave. and in the lot at Tower rove Baptist Church, across the street at the corner f Tower Grove Ave. and Magnolia St. ☐

NTRODUCTION TO PRINCIPLES OF ECOLOGY, BOTANY, AND ANIMAL BEHAVIOR

This course is oriented toward activities, problem olving, and discussions of topics such as natural ommunities cycling and territoriality. It is especially pertinent to people working with groups and outdoor nature education. A science background is not a pre-requisite to this course which carries 2 hours of ndergraduate credit. The course will be offered at he Arboretum eight consecutive Saturdays starting on March 24, from 1:00 to 4:00 p.m. For more nformation please contact the St. Louis University Environmental Studies Institute at 535-3500, extenion 421. ☐

CALENDAR OF EVENTS

Special Events

Month of February	Japanese Art Print Exhibit – Sponsored by Missouri State Council on the Arts – Library Exhibit Area – Lehmann Bldg. – by reservation – weekdays only
February 2	Orchid Show Preview Party – Members and Their Guests – 5:30 to 7:30 p.m. – Climatron
February 3 through March 20	Orchid Show – Climatron
February 16	Horticulture Lecture – "Garden Design" – 10:30 a.m. – Growing Center – Open to Public
February 20	Horticulture Lecture – "Garden Design" – 7:30 p.m. – Lehmann Bldg. – Auditorium – Open to Public
February 28	Botany Lecture – "Plants vs. Insects – The Unending War" – Dr. Peter H. Raven – 8:00 p.m. – Lehmann Bldg. – Auditorium – For Members and Their Guests – By reservation
March 3 and 4	St. Louis African Violet Society Show – Sat. 2:00 to 5:00 p.m. – Sun. 9:00 a.m. to 5:00 p.m. – Floral Display House.
March 10 and 11	Homeowners Day – Sat. 10:00 a.m. to 4:00 p.m. – Sun. 12 noon to 4:00 p.m. – Floral Display House – Growing Center – Head House
March 28	Botany Lecture – "Shifting Continents and Theories – A New Look at Plant and Animal Distributions" – Dr. Peter H. Raven – 8:00 p.m. – Lehmann Bldg. – Auditorium – For Members and Their Guests – By reservation

Adult Classes

(Reservations Only)

February 14	Tropical Terrarium Workshop – 10:00 a.m. to 2:00 p.m. – Lehmann Bldg. – Fee: $12; Members $10
February 21 and 28	"Introduction to Herb Gardening" – 10:00 a.m. to 2:00 p.m. – Lehmann Bldg. – Fee: $12; Members $9
March 17 and 24	"Organic Gardening" – 10:00 a.m. to 12 noon – Arboretum – Fee: $10; Members $8

CHILDREN'S SATURDAY NATURE STUDY

10:00 to 11:30 a.m. –Lehmann Bldg.

February 10	"Mystery of the Orchid" – Fee: $.25
February 24	"Making a Terrarium" (Bring wide mouth jar or small glass bowl) – Fee: $.50
March 10	"Plants in a Capsule" – Fee: $.25
March 24	"Miniature Gardens" (Bring rigid container, maximum size 10" x 10" x 3" deep) – Fee: $.50

. . . . Spring is always a special time for gardeners. And Spring is a special time at the Garden. Events coming up will include the Spring Flower Show in the Floral Display House in March. Special trip to the Arboretum for the Membership in April. The announcement of the Garden trip for 1973. Members Day in May. And the second appearance of the Saint Louis Symphony Orchestra at the Garden on Saturday, June 2. Mark the date on your Calendar now. The beauty of the music in the setting of the Garden is enchanting.

The Missouri Botanical Garden is a Fund Member of the Arts and Education Council of Greater St. Louis

NEW MEMBERS OF GARDEN

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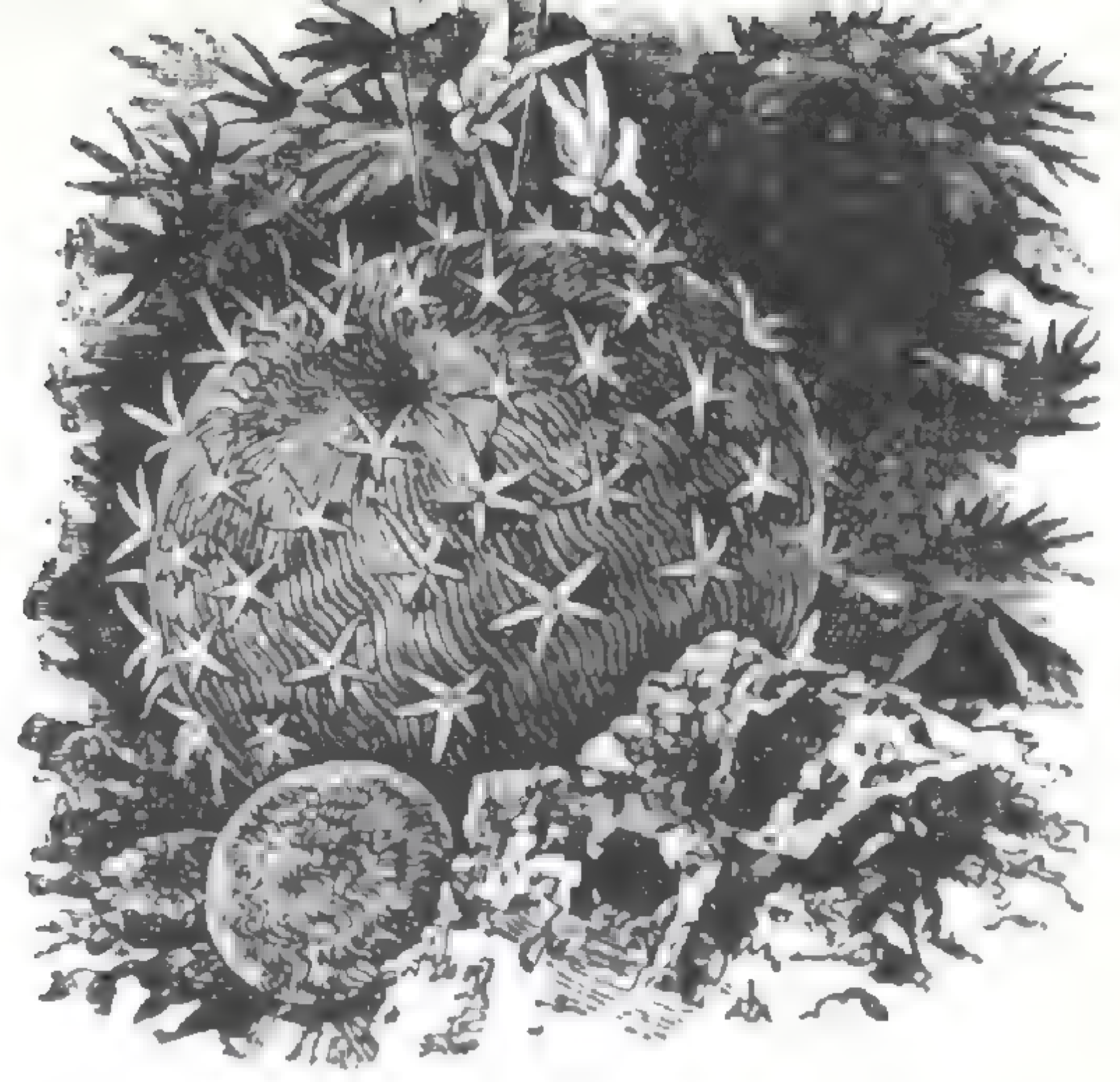


DOUBLE FEATURE FOR SPRING

FIELD DAYS FOR GARDENERS

Two Field Days for Gardeners, on March 10, from 10:00 a.m. until 3:00 p.m., and March 11, from noon until 4:00 p.m., will be held in the Floral Display House.

Activities at the Field Days will include displays, demonstrations, information booths, and assistance in planning your garden for the coming season. There will be help for every kind of gardener – whether your garden consists of a few pots, or a large plot. And whether you garden in a window box, or an apartment balcony or patio, or in a large yard.

Booths will be set up throughout the Floral Display House. Members of the Garden's horticultural staff, the St. Louis Herb Society, St. Louis Arborists Association, consultants and representatives of companies from the St. Louis area, will be there to give advice in their particular fields. Printed material on all sorts of subjects relating to home gardening will be available.

"Green thumbers" will find the different displays about herbs, annuals and perennials, roses, mulches and composting, and plant sprays of particular interest. There will be organic gardening displays also. The care and maintenance of shade trees, pruning small trees and shrubs, and ways to maintain expanses of green lawn in St. Louis will be explained.

For apartment and town house gardeners, there will be special sections on "container gardening" and ground covers; how to build a window box and what to plant in it.

If you prefer to garden indoors, discover more about exotic house plants, African violets, orchids. And for light on the subject, learn about using fluorescents inside and nighttime lighting for spectacular effects outside.

Two different hobby greenhouses will be set up to examine; and a cold frame also, with instructions available on how to build it. Various garden tools and machines will be displayed, with hints on where and how to use them.

Books about gardening, an answering service, educational opportunities in horticulture. The Garden is the place for gardeners the second weekend in March!

This event is co-sponsored by the St. Louis County Water Company, and we thank the Company for making this possible.

SPRING FLOWER SHOW

The 1973 Spring Flower Show will open March 24 and continue until April 22 in the Floral Display House. Romantic and nostalgic, the design this year will include a grist mill and pond.

Flowering trees will be a focal point – weeping cherries, Kwanzan cherries, flowering crabs, and dogwood with background shrubs of forsythia, spirea, and quince in the pastels soon to be seen throughout the city.

The flowers in the show whose color and fragrance set the mood for Spring, represent new varieties and old favorites. Iris and delphinium, calceolaria, daisies and stock, tulips and hyacinths, nasturtium, heliotrope, primroses and lilies, marigolds, zinnias, geraniums, are some of the colorful blossoms which will be seen in this show.

Members of the Garden will preview the show the evening before it opens at a party made possible through the generosity of Stix, Baer and Fuller. ☐

Volume LXII, Number 2
March, 1973

LAD

1908 - 1973

LADISLAUS CUTAK

Ladislaus Cutak, a staff member of the Missouri Botanical Garden for 46 years, died January 18, 1973, after an illness of several months. Lad, as everyone knew him, was a man of many accomplishments and an indefatigable worker.

He was born May 27, 1908, in Austria of Bohemian parents. His father, who received his horticultural training in Europe, was employed at Schonbrunn, recognized as the greatest of the imperial castles, in Vienna. The family emigrated to the United States in 1912, and came directly to St. Louis, where Lad's father was employed at the Garden until his death.

Lad attended parochial school and the St. Louis Preparatory Seminary. During an emergency, Dr. Benjamin Duggar of the Garden staff, employed him temporarily; on May 4, 1927, at the age of 19, Lad Cutak became a regular employee of the Garden, doing ordinary garden chores such as spading flower beds, picking up leaves, potting, planting and weeding. He soon realized that he would like to follow in his father's footsteps, and received all his botanical training at the Garden. Lad attended the apprentice school and sat in on lectures of the professional staff.

With diligent application, his ability became apparent, and he was placed in charge of the main Conservatory housing exotic plants, in 1933. The Cactus and Succulent house intrigued him more than any other, with its bizarre and fantastic plants. He began to study them, and soon they became his overwhelming interest.

Since his first collecting trip into the desert in 1935, he travelled more than 100,000 miles – in this country, Mexico, Central and South America – searching for seeds and living materials to enhance the collection at the Garden. In 1969, Lad led a tour through South America, the first trip sponsored by the Missouri Botanical Garden.

Though cacti and succulents were always his chief pets, Lad was a lover and student of various other exotic flora; he took an avid interest in bromeliads, aroids, aquatics, and ornamental trees and shrubs.

He is the author of two books about cacti, and more than three hundred articles, pamphlets, and bulletins. A warm and witty lecturer, he was much in demand as a speaker for garden clubs, civic, religious, and social organizations throughout the country. His talks were illustrated with color slides which he took himself.

He was appointed to life membership in the Cactus and Succulent Society of America, was a member of the International Organization for Succulent Plant Study, and founded the Henry Shaw Cactus Society. In 1968, he was awarded the St. Louis Newspaper Guild's Page One Civic Award.

He is survived by his wife, Lydia, three sons, and four grandchildren.

The following are tributes from his colleagues and friends who worked so closely with him through the years.

LAD CUTAK, THE HORTICULTURIST

Garden visitors usually found Lad bending over his precious cacti taking pictures for his prodigious photographic collection. This gentleman, always young in heart, was my dear friend since his childhood. With pride I remember him as my first protege.

One day, Joe Cutak, in charge of the exotic plants at Shaw's Garden came to me and asked if I would consider giving his teenage son a job. Rather than make Lad feel his father got a job for him, I suggested the boy come to my office and apply for a position. He impressed me so favorably with his enthusiasm for plants that I invited him to report for work the next day as assistant gardener in the main conservatories.

From the beginning, Lad's interest concentrated on indoor plants and cacti in particular. His curiosity about plants and his desire to learn prompted me to propose that he attend lectures offered under the Henry Shaw School of Gardeners. He progressed rapidly and earned excellent grades. He loved to spout long Latin plant names which came as second nature to him.

A great disaster showed me Lad's loyalty, responsibility, and concern for the Missouri Botanical Garden. The great hail storm of 1927 with its 6-inch stones that destroyed every pane of roof glass in the conservatories brought Lad running to the Garden on a Sunday morning. He found most of the plants in the greenhouses woefully wrecked and immediately began the huge clean-up job which took most of the summer. He was delighted, though, to find that his beloved cacti showed the least damage due to their protective thorns. All supervision of the repruning of economic plants and palms was done by Lad.

Lad's expanding knowledge of cacti sparked a growing interest in this family of plants in the St. Louis area. It was no surprise when he founded the Henry Shaw Cactus Society and became its perennial president. From that time on an annual cactus show occurred in the Floral Display House under Lad's inspiration. The St. Louis Horticultural Society, also, chose him as their president.

He became intrigued by the environmental character of cacti in their natural habitat. This led to numerous study trips to Mexico and the southwestern states. But his most thrilling trip was on invitation by an oil company to visit tropical plantings in Columbia, S.A.

Photography grew to be his dearest hobby and as his skills increased his slide files burgeoned. Garden and other clubs demanded his time as a lecturer. His bubbling and humorous delivery made him a most popular speaker from coast to coast.

As an authority on cacti, he answered so many questions from visitors and wrote so many articles in garden publications that it prompted him to take pen in hand and write two books, titled, *Cactus Guide* and *Cactus Personified.* He, also, wrote a column called "Spine Chats" in the Cactus and Succulent Journal. Lad broadcast on radio and TV and was a panelist on KFUO's "How Does Your Garden Grow?" series.

When the Climatron was built, Lad took charge laying out the plantings. He brought palms from Florida to replace those lost in the long construction delays.

In his later years, Lad was appointed head of Public Relations doing an excellent job of Garden publicity. However, his heart was always with his plants.

The Garden employees as well as the public held Ladislaus Cutak in high esteem. His friends will miss his jovial presence.

George Pring

As a delegation from the Henry Shaw Cactus Society, we wish to present to the Missouri Botanical Garden the following in memory of Mr. Ladislaus Cutak who passed away January 18, 1973.

We propose that "The Ladislaus Cutak Memorial Fund" be established by the contribution of $3,000.00 from the Henry Shaw Cactus Society on February 2, 1973. This fund is to be used to assist in the maintenance and continuance of the Cacti and Succulent Collection at Missouri Botanical Garden for people of today as well as future generations to observe, study and enjoy. A small plaque indicating the existence of this fund is to be displayed in a suitable location at the Garden. . .

The Henry Shaw Cactus Society was founded by Mr. Ladislaus Cutak in 1942 and today has members and friends around the world.

The Missouri Botanical Garden has long been associated with the study of cacti, dating back to Dr. George Engelmann, who began publishing information on cacti in 1846 – 127 years ago. For this reason we feel that it is fitting and proper for "The Ladislaus Cutak Memorial Fund" to be established at the Missouri Botanical Garden.

HENRY SHAW CACTUS SOCIETY
Dorothy Weitz, President
Lillian C. Mackle, Treasurer

Lad's warm personality drew people to him. He was good natured, jovial and ready to help anyone. He worked long hours and continued his research and writings at home in the evening. Why say more, we are richer for having known Lad and will miss him.

Paul Kohl, Floriculturist

Our District lost a very dear and devoted friend with the passing of Lad Cutak. He was a faithful ally since the early days of our District and gave tirelessly of his time lecturing on his favorite subject to our many garden clubs. To honor his memory, the Clubs within our District, are presenting to the Missouri Botanical Garden Library, special gifts, as a Cutak Memorial collection.

Mrs. Ray Schlereth, Director
East Central District
Federated Garden Clubs of Missouri

The MISSOURI BOTANICAL GARDEN BULLETIN is published 10 issues per year monthly except January and August, by the Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Mo. 63110. Second class postage paid at St. Louis, Mo.

SUBSCRIPTION RATES:
$5.00 per year. $6.00 foreign.

THE DESERT HOUSE

The renovation of this Desert House was made possible by the generous gift of Sarah Sullivan in memory of her husband

Owen Jacquemin Sullivan
August 8, 1878 – December 7, 1957

The Desert House, the conservatory just south of the Climatron, was renovated in 1971, through the generosity of Mrs. Owen Sullivan. Plantings within the house typify the Warm Desert, the Sonoran Desert of the lowlands around the Gulf of California, the Chihuahua Desert extending from New Mexico and West Texas into Mexico, and desert regions of South America and Africa. Hundreds of miles of arid landscape are depicted along the winding walk. The mural along the east wall portrays the vibrant hues of the desert sky.

The strange experience of walking into the Desert House for the first time is matched only by the strangeness of the desert itself. The peculiar life-forms of the plants, especially of the *Yucca,* the *Agave,* and of the large cactus *Cereus,* attest to the harsh environment which has been the evolutionary force creating the bizarre forms of vegetation.

The plants of the desert have adapted to conserve water. Everyone expects to find cactus in the desert. These plants conserve water because they have nearly lost their leaves: what is left of the leaves is just the sharp spines. Water is stored in the fleshy stem. The spines protect the plant from animals which may graze the blossoms and fruits, and the spines also provide some shade to keep the stem cooler.

Not all desert plants have changed their leaves to spines. *Yucca* and *Agave* have simply changed their shape and size. These plants have fleshy leaves in which moisture is stored, and the leaves have sharp points to ward off predators. More than eighty varieties and species of plants which have adapted to these climatic conditions can be found in this greenhouse.

Several specimens in the Desert House have been in the Garden's collection of plants for more than half a century. The two *Yucca carnerosana* were gifts from the United States Department of Agriculture exhibit at the World's Fair in 1904; the *Dasylirion quadrangulatum* was acquired from the Mexican exhibit at the Fair.

The latest acquisition is a magnificent specimen *Fouquieria splendens*, which came to us through Dr. James Henrikson of California State College in Los Angeles. Its common name, *Ocotillo,* identifies it to anyone familiar with the American Southwest, as a dominant plant of the Chihuahua and the Sonoran low plains desert.

The Desert House is a remarkable replica of environmental characteristics of the desert. The only climate features we cannot duplicate are the strong desert winds, and the absence of atmospheric humidity. These plants came to us with built-in devices which actually prevent them from using St. Louis' abundant humidity to their advantage.

Come to our Desert – study the vegetation, its form, its texture. □

Gardening in St. Louis

GARDENING HINTS FOR MARCH

This is the month when all gardeners really get back into harness and find numerous jobs that are now musts. Tools that were not cleaned, oiled and sharpened must be done now.

This is the month to attend garden workshops and flower shows to see the latest varieties for the summer garden. Carry a small notebook — a camera with a simple flash attachment is a good notebook — and record without embarrassment and in whatever way seems most helpful the exhibits or parts of exhibits that interest you.

Many plants are best planted when dormant, so select new shrubs and evergreens and get them in the ground as early as possible. Dormant rose bushes cost less than potted ones, are easier to ship and often make superior plants through the ensuing seasons. Dormant rose bushes must be planted when dormant. Once they start growing out of the ground, they start weakening.

Coldframes and hot beds need special care. On warm days, ventilate well and watch for sudden drop in temperature. This is also true of the home greenhouse. Many annuals can now be started, but do not plant too early for fast developing types. Wait on these till later. Annuals to sow now include petunias, verbenas, calendulas, snapdragons, carefree geraniums. Vegetables to start now are cabbage, lettuce, celery, onions, tomatoes. Peas should be planted in the ground immediately if this has not been done already. Start tubers of cannas and caladium now and glads may be planted outdoors from the middle of the month on for early summer cut flowers. Plan to plant at intervals of about three weeks to give continuous bloom.

Watering and feeding of indoor plants will need to be stepped up now with better light and growing conditions. Repot plants that need it and pinch to encourage good branching and better growth.

This is a good time to take cuttings of geraniums, coleus, fuchsias, abutilons (flowering maple), dieffenbachias, philodendrons and others for planting outdoors later.

Lawns should be carefully raked to clean up all debris of old leaves, twigs, etc. Bare areas should be dug over, adding humus and planting good seed. Fertilize to encourage good root growth. Top dress lawns when possible with rich top soil and organic matter. Aerate compacted areas and roll lawn lightly to firm grass roots. Rolling is not done to level a lawn.

Mulches should be removed very gradually and not eliminated until all heavy frosts are past.

Prune broken twigs and branches. Raspberries should have the old cases removed if this was not done earlier. Fruit trees should be completely pruned now if not done earlier to remove weak or crossed branching and to head tops back to control height.

Fall flowering perennials such as asters, phlox, and others should be divided and reset now. Fertilize beds well with organic matter and bone meal; bone meal is beneficial also around roses. Remove all weeds from borders and flower beds that were left from last fall. These will be growing actively and if allowed to persist will soon produce more seed. Once areas are cleaned up, apply mulches lightly to prevent weeds and loss of moisture.

Avoid disturbing roots of azaleas and rhododendrons which are produced near the surface. Apply cottonseed meal as growth commences and add mulch around plants if needed. ☐

CACTUS MAKES STURDY HOUSE PLANT

The cactus makes an interesting and sturdy house plant. The succulent bodies of cacti help them readily adapt to trying conditions and enable them to tolerate neglect.

The cactus family is a large one, ranging from the giants of Arizona that weigh several tons to button cactus the size of a penny. Many of them have adapted to hot, sunny, desert conditions, but others are native to the tropics and grow alongside the orchids in shade, high humidity, and organic materials.

A collection of desert cacti can be novel and interesting and may require little care, but a proper location is important. No plants are so light demanding as cacti. In poor light they may cling to life but gradually decline in vigor. Place them in the brightest window available in the home.

Poor growth or death of desert cacti indoors usually results from overwatering if light is adequate. Starting in late March, water frequently enough that plants do not shrivel from dryness or rot from too much water. Each watering should be thorough, but allow the soil to dry well between waterings. Gradually reduce the frequency of watering in late September to prepare for the winter dormant period. Little water is needed during the dormant period, but apply enough to prevent excessive shriveling.

Perfect drainage is one of the most important features of a soil mix for cacti. The proper mixture should be difficult to overwater, thereby reducing the danger of rot. Do not plant cacti in pure sand, however.

(Continued)

A popular soil mixture for cacti is made from two parts coarse sand, two parts good garden soil, one part crushed flower pots or crushed soft bricks, and 1/2 part well decomposed leaf mold or peat moss.

Small quantities of coarse sand are available from some garden shops or pet stores. Avoid using building sand that is fine and tends to cake.

After all danger of frost is past in late spring, cacti may be moved outdoors. Make the transition gradually, but finally locate them in a sunny place. They will need frequent watering and occasional fertilization when active growth is taking place. Always maintain good drainage. Do not submerge the pots in the flower garden.

Not all cacti should be treated in this manner. Those with leaves or flat, leaf-like stems – such as the Christmas cactus and orchid cacti – need rich, humusy soil. They like good light but in mid-summer should be given shade, especially during the afternoon. Normally they require more frequent watering than the desert types, and excessive drying may be harmful.

In the fall, watering should also be reduced to promote dormancy and the development of flower buds. Cool temperatures around 45 to 50 degrees during the resting state also aid flower bud development in many cacti. When flowering begins, the amount of water supplied may be increased. □

ROBERT W. JOHNSTON LEAVES FOR WASHINGTON POST

Robert W. Johnston, Vice Chancellor for Research at Washington University, has been appointed Associate Executive Officer of the National Academy of Sciences, effective April 1, 1973. Dr. Johnston has made important contributions to the Missouri Botanical Garden while representing Chancellors Eliot and Danforth of Washington University at meetings of the Board of Trustees for the past three years. With his national experience and academic orientation, he was often able to provide useful insights into complex situations.

We congratulate him on his new position, one in which he can do much good in the development of the nation's science policy. Dr. and Mrs. Johnston will take with them to Washington the good wishes of their numerous friends in St. Louis and at the Garden. □

The Missouri Botanical Garden is a Fund Member of the Arts and Education Council of Greater St. Louis

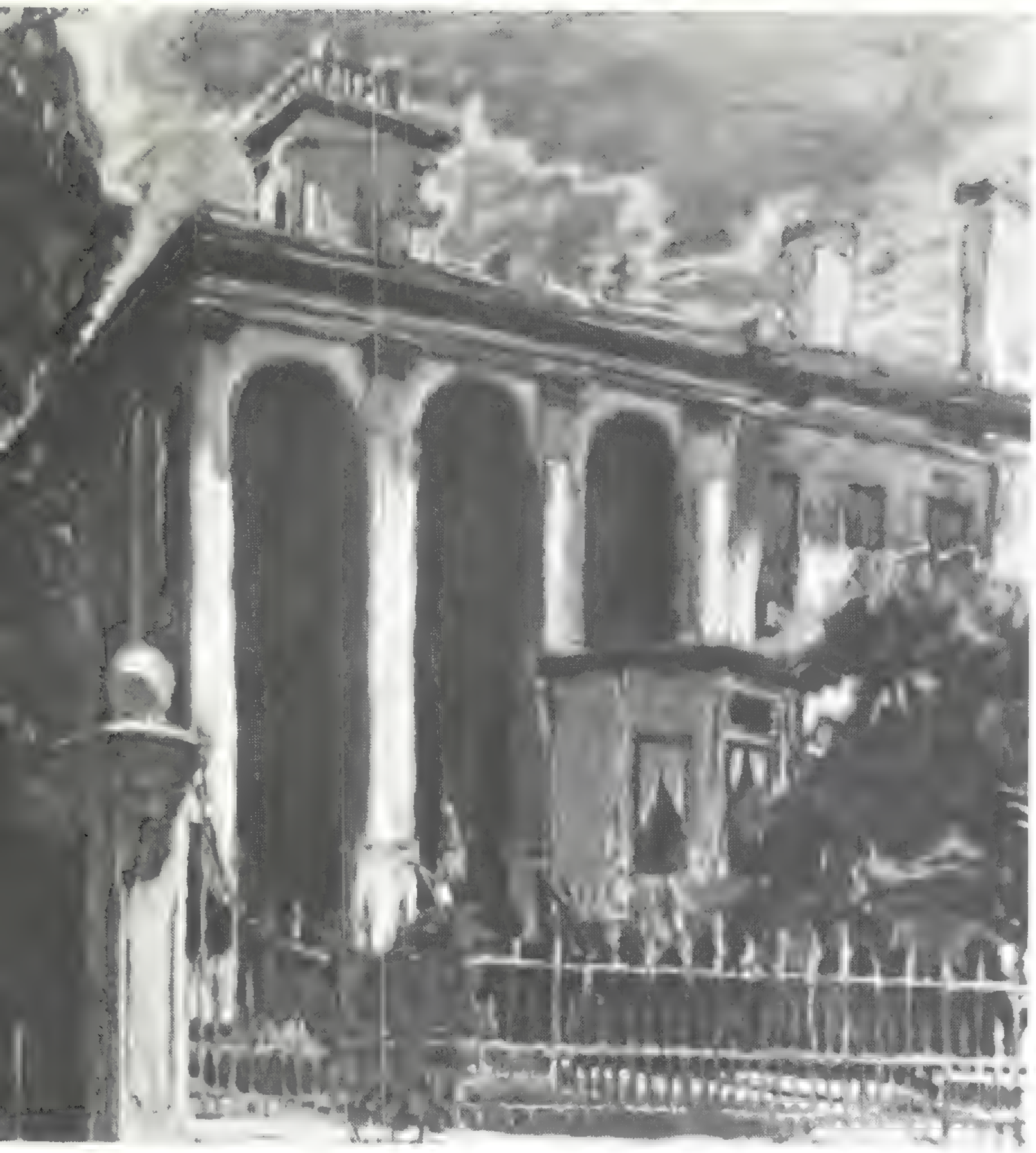
LEICESTER FAUST BECOMES HONORARY TRUSTEE

At the annual meeting of the Board of Trustees of the Missouri Botanical Garden, January 17, 1973, Leicester Busch Faust was named an Honorary Trustee of the Garden. We would like to take this occasion to thank him for his many years of support for the Garden and for other civic causes. Mr. Faust served as an active member of the Garden's Board for nearly 21 years, 1953-1973. During this time, he occupied the position of vice president from 1959 to 1966, and was active on the Garden's Historical Committee in the same period.

Of Leicester Faust it can truly be said that the Garden is a more beautiful place today than it would have been without his efforts. Financial support given the Garden by Mr. and Mrs. Faust was primarily responsible for the construction of the beautiful lily pools east of the Climatron in 1964, and for one of the new greenhouses completed in 1968. This greenhouse is dedicated to the memory of Mr. Faust's mother, Anna Busch Faust. Mr. and Mrs. Faust have also contributed generously to the Garden on many other occasions, including the construction of the Climatron in 1959.

A grandson of Adolphus Busch, Leicester Faust was born in St. Louis in 1897. In 1935 he entered the Grain Department of Anheuser-Busch, serving as vice president of the company from 1947 to 1952. He was president of the Merchants Exchange of St. Louis in 1945.

With his sister, Mrs. Mahlon B. Wallace, Jr., Mr. Faust presented several important works of art to the St. Louis Art Museum and to Washington University. He also served on the boards of the Saint Louis Symphony, and of the St. Louis Priory and School,



IEW PAINTING GIVEN TO THE GARDEN

"TOWER GROVE," a painting by Louis Bartig, is
ow hanging in the lobby of the John S. Lehmann
uilding. A gift of Mr. and Mrs. Sidney S. Cohen, it
vas purchased at the artist's "Environmental Paint-
ngs" exhibit last fall at Famous-Barr Clayton's Art
allery, and presented to the Garden.

Louis Bartig is a native St. Louis artist who
eceived his training from St. Louisans Vera Flynn,
im Harmon, and Fred Conway. His canvasses glow
ith vibrant pastels, his palette inspired by Bonnard
nd Villard and the Impressionist painters. Although
is subject matter is representational, the colors are
ot the ones found in nature, and, therefore, abstract.

Bartig's "Tower Grove" should inspire viewers to
ok at Henry Shaw's country home with new ap-
reciation of colors and shapes.

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as been active in the St. Louis Chapter of the
merican Red Cross and served as president of
ndustrial Aid for the Blind.

In March, 1968, Mr. and Mrs. Faust presented their
ountry home, the former estate of Frederick Bates,
e second Governor of Missouri, comprising 98.5
cres, to the people of St. Louis County. In recogni-
on of this fine gift, the St. Louis County Council
amed the new park, which gives pleasure to thou-
nds of visitors annually, "Faust County Park."

We hope that Mr. Faust, as Honorary Trustee, will
ontinue to give us the benefit of his genial presence
nd wise counsel for many years to come. In addi-
on, we wish him and Mrs. Faust every happiness in
e future.

CALENDAR OF EVENTS

Special Events

March 3, 4	St. Louis African Violet Society Show Floral Display House
March 10, 11	Field Days for Gardeners Floral Display House Saturday 10:00 a.m. - 3:00 p.m. Sunday 12:00 noon to 4:00 p.m.
March 16	Horticultural Lecture "Organic Gardening" Growing Center — 10:30 a.m.
March 23	Spring Flower Show Preview Party Floral Display House 5:30 p.m. - 7:30 p.m.
March 24 through April 22	Spring Flower Show Floral Display House
March 28	Botany Lecture Speaker: Dr. Peter Raven Director, Missouri Botanical Garden Lehmann Building Auditorium 8:00 p.m. (By reservation)
April 13	Horticulture Lecture "Spring Gardening" Growing Center - 10:30 a.m.

Adult Classes (Reservation Only)

March 17, 24	"Organic Gardening" Instructor: William Davit Arboretum — 10:00 a.m. - 12:00 noon Fee: $18; Members $8
	"Gardening From the Ground Up" Education Department Fee: $17; Members $12.50 Instructors: Kenneth Peck and Clarence Barbre
March 27 April 3, 10, 17, 24	Section A 1:00 p.m. - 2:30 p.m.
March 29 April 5, 12, 19, 26	Section B 10:00 a.m. - 11:30 a.m.
April 4, 11	"The Shape of Things to Come" Instructor: Robert Dingwall Course on Pruning, New Growing Houses 10:00 - 11:30 a.m. Fee: $8; Members $6
April 14	"Home Orchid Culture" Instructor: Robert J. Gillespie New Growing Houses - 10:00 a.m. - 3:00 p.m. Fee: $10; Members $8

Children's Classes

	Lehmann Building 10:00 - 11:30 a.m.
March 10	"Plants in a Capsule" Fee: $.25
March 24	"Miniature Gardens" Fee: $.25 (Bring rigid container 10x10x3" deep)
April 7	"Sowing Seeds" Fee: $.50

A MESSAGE FROM JOHN EVERITT, Executive Director,
The Arts and Education Council of Greater St. Louis

As the 1973 Campaign begins, the Arts and Education Council will have completed the weeks of intensive research and planning that go into the nation's largest annual united art fund campaign. The goal this year of $1,100,000 represents a major and bold leap forward. Why, you may ask, are the arts always looking for money in ever increasing amounts?

Ludwig Van Beethoven's Ninth still takes just so long to play. With all the technological advances of our time we cannot cut it down! We still need 100 or more Symphony musicians to play it the way the composer wrote it. So in music we cannot streamline our product and market it at a reduced rate on a quantity basis. Theatre is the same way -- the actors and stagehands still have to work as hard as they did in Shakespeare's time -- perhaps harder. In the Garden we cannot make the seasons longer or control the rainfall -- nature is a strong-willed force.

But the people that make this happen -- the beauty of the Garden, the music, the theatre -- have to pay increasing costs of living the same as everyone. Most of them exist on salaries way below the national average and yet we expect more and more from them every year. Mundane things like house cleaning materials, supplies, phone rates and federal taxes creep higher every year. When you look around the beautiful Missouri Botanical Garden -- think just a moment of the people who keep it that way. Then look to a stage where the artists perform, and imagine the workers backstage. All of these people and tasks make up a cultural institution, and they must be paid a living wage.

That's why the Arts and Education Fund has to ask for more money each year. The Fund members strive to give you better quality work, innovative programs, and teach your children the value of an appreciation of aesthetics. They try to entertain you, to dramatize social issues, to reflect the culture of our time. But we cannot sell these fabulous products as you can sell laundry soap, making a handsome profit for our labors. The arts are handmade articles, their profits intangible. We believe we are contributing to a better way of living for everyone in St. Louis. That's why we proudly turn to you for necessary dollars in ever increasing numbers.

MISSOURI BOTANICAL GARDEN BULLETIN
2315 Tower Grove Avenue
Saint Louis, Missouri 63110

SECOND-CLASS
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Missouri Botanical Garden Bulletin

4/13/73

OAKS BLOSSOM AT ARBORETUM

Now is the time to visit the Arboretum to walk along the woodland trails, to look for tiny wildflowers, to reflect on nature, and man's relationship to it.

Why do some plants have showy flowers, while others are inconspicuous plain Janes? Why do wildflowers bloom when they do? How do they know when the time is right? Or even, when is a flower wild?

Edgar Anderson was fond of noting when botanizing at the Arboretum, that the simplest questions are the hardest to answer. And yet, they are perhaps the most important and most worthy of our consideration. Man, in his rush to construct ever increasing highways and subdivisions, tends to forget that he is a very recent intrusion into a plant community inconceivably more complex than his own.

Recent publications by botanists and ecologists offer us some generalities on the subject — some very fascinating generalities. But as with all good answers, they tell us how little we actually understand, and raise more new questions than they answer. These answers intrigue us ever deeper into the subject. Soon we realize that the information can't be found in books, and we are forced into the field, to make our own observations.

With this warning, we offer you some "answers" to our earlier "simple" questions, hoping they might capture your interest and seduce you into a walk in the woods, at the Arboretum, where there are acres of magnificent Ozark landscape, and over 600 species of native flowering plants. We would be delighted to have you hiking (and asking and answering a few simple questions of your own) on the numerous wildflower trails developed under the direction of Dr. Anderson.

Blooming Schedule

APRIL AND MAY

ARBORETUM

Flowering Trees

Flowering Dogwood, *Cornus florida*
Fragrant Sumac, *Rhus aromatica*
Pawpaw, *Asimina triloba*
Redbud, *Cercis canadensis*
Service Berry, *Amelanchier arborea*

Meadows

Black-eyed Susan, *Rudbeckia hirta*
Bluets, Quaker Ladies, *Houstonia minima*
Miami Mist, *Phacelia purshii*
Moustail, *Myosurus minimus*
Tradescantia, Widow's Tears, *Tradescantia ohiensis*
Wild Johnny-Jump-Up, *Viola rafinesquii*
Wild blue flag, *Iris virginica*
Wooly blue violet, *Viola sororia*

Glades

Bird-foot violet, Wild pansy, *Viola pedata*
Buckthorn, *Rhamnus lanceolata*
Creeping skullcap, *Scutellaria parvula*
Evening primrose, *Oenothera missouriensis*
False Garlic, *Nothoscordum bivalve*
Indian paint brush, *Castilleja coccinea*
Leather-flower, *Clematis fremontii*
Leavenworthia, *Leavenworthia uniflora*
Nemastylis, *Nemastylis geminiflora*
Ninebark, *Physocarpus opulifolius*
Sandwort, *Arenaria patula*
Shooting star, *Dodecatheon meadia*
Tradescantia ernestiana
Wild Coreopis, *Coreopsis lanceolata*
Yellow Star-grass, *Hypoxis hirsuta*

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April, 1973

Blooming Schedule

APRIL AND MAY

ARBORETUM

Woodlands

Adder's tongue, *Ophioglossum Engelmanni*
American Bladder-nut, *Staphylea trifolia*
American Sweet-Cicily, *Osmorhiza claytoni*
Four-leafed milkweed, *Asclepias quadrifolia*
Beard-tongue, *Penstemon pallidus*
Bellwort, *Uvularia grandiflora*
Black haw, Wild raisin, Ozark viburnum, *Viburnum rufidulum*
Bloodroot, *Sanguinaria canadensis*
Blue phlox, Wild Sweet William, *Phlox divaricata*
Columbine, *Aquilegia canadensis*
Common blue violet, *Viola papilionacea*
Dutchman's breeches, *Dicentra cucullaria*
Dwarf larkspur, *Delphinium tricorne*
Dwarf wild Iris, *Iris cristata*
Fire Pink, *Silene virginica*
Golden Seal, *Hydrastis canadensis*
Green dragon, *Arisaema dracontium*
Green violet, *Hybanthus concolor*
Indian cherry (POISONOUS), *Rhamnus caroliniana*
Indigo Bush, *Amorpha canescens*
Jack-in-the-pulpit, *Arisaema atrorubens*
Jacob's ladder, *Polemonium reptans*
Lone Leaf, White Adder's tongue, *Erythronium albidum*
May Apple, Mandrake, *Podophyllum peltatum*
Puccorn (Orange Puccoon), *Lithospermum canescens*
Pale corydalis, *Corydalis flavula*
Quillwort, *Isoetes butleri*
Rattlesnake fern, *Botrychium virginianum*
Rue anemone, *Anemonella thalictroides*
Small-flowered Buttercup, *Ranunculus abortivus*
Solomon's Seal, *Polygonatum canaliculatum*
False rue anemone, *Isopyrum biternatum*
Spring beauty, *Claytonia virginica*
Spring bee balm, *Monarda russeliana (Monarda bradburiana)*
Squaw weed, *Senecio aureus*
Starry Campion, *Silene stellata (Night blooming)*
Toothwort, *Dentaria laciniata*
Virginia Blue bells, *Mertensia virginica*
Wild chervil, *Chaerophyllum procumbens*
Wild Geranium, *Geranium maculatum*
Wild Ginger, *Asarum canadense*
Wild Hyacinth, *Camassia scilloides*
White violet, *Viola striata*
Wood poppy, *Stylophorum diphyllum*
Wood Spurge, *Euphorbia commutata*
Waterleaf, *Hydrophyllum canadense*
Woolen breeches, *Hydroplyllum appendiculatum*

Why do some plants have showy flowers? The flower is the reproductive organ, and seed production depends upon the proper transfer of pollen. For self-pollinating plants (those plants whose flowers can be pollinated with their own pollen) the problem is not too great; the flower has only to arrange its parts so that the pollen can fall from the anthers down into the ovule. Many self-pollinating plants have unusual forms, assuring the transfer of pollen from one part of the flower to another. Form, rather than color, is the important characteristic of these plants.

For reasons of evolutionary stability, however, the majority of flowering plants require cross-pollination— each flower pollinated from a different plant. A rather difficult transportation problem when the plant is rooted firmly in one place. Plants have solved this problem with a variety of complex strategies — and typical plants at the Arboretum offer some interesting examples.

Since pollen grains are very tiny and light, the wind serves as one means of dispersal. Many plants, including trees such as the oaks and hickories, and most of our grasses, are wind-pollinated. The wind is not particularly discriminating, and will carry with it many kinds of pollen as it blows through field and forest. Since the wind is really an unappreciative audience, there is no advantage to the flower for producing colorful showy flowers; most of these plants possess very dull, inconspicuous flowers.

But what of the less common species such as dogwood, or the wild violet, where the individuals are often found scattered far apart? If left to blow with the wind, pollen grains would be lost before their happenstance flight took them to another dogwood or violet. It is here that is found the evolutionary necessity responsible for the development of showy colorful flowers in certain plants. Their strategy has been the attraction of various birds and insects, who act as couriers of their pollen grains. The various colors, shapes, and odors of these flowers are not accidents, but rather, suggest an intricate and complex relationship between that plant and its animal pollinators.

A hike in the Arboretum could provide many clues to the variety of tactics used by local wildflowers to achieve cross pollination. For example, plants like the common bull thistle (Circium vulgare) for which butterflies are common visitors, have a special place for the butterfly to sit so it can comfortably sip nectar, and, as it does, pick up some pollen. Plants in the milkweed family (asclepidaceae) use colors and nectaries especially designed to attract bees. Their pollen is found in small sacs which have special slots shaped to catch on the leg of a visiting bee and be carried off to the next milkweed visited. The large yellow evening primrose (Oenothera missourienses) blooms at night on the open glades, and as you might guess, it is pollinated by a moth.

Since different birds and insects vary in their ability to see colors, the color of the flower is also an important clue. Bright red flowers are frequently pollinated by hummingbirds, rather than insects, as the vision of most insects does not include the red end of the spectrum. The bright red flowers of the trumpet vine (Campsis radicans), to an insect's vision, blend in with the green background, but are quite conspicuous to a hummingbird.

The color and showy design of most flowers is related to the way in which the flower is pollinated. The color, structure, and pattern of wild flowers are not merely aesthetic ornaments for our enjoyment, but represent highly functional strategies for survival.

With the intricate beauty and diversity of the wildflowers, the refreshing smells and sounds of the spring forest, making a few observations in pollination ecology could provide a pleasurable excuse for taking that overdue respite from the city; and it could provide a never ending interest in wildflowers, one neither requiring a knowledge of their names, nor fading in enjoyment after their names have been learned. All that is needed is an opportunity for simple observation, common sense reasoning, and a love of being out of doors.

What better time and place than this weekend at the Arboretum!

With the completion of highway I-44, the Arboretum is now an easy drive of less than an hour from any part of the St. Louis area. It is located 35 miles southwest of St. Louis on I-44. Exit at Gray Summit, cross over the highway and turn right. The main gate is to the left. The gates are open every day from 8 a.m. until 5 p.m. □

MISSOURI WILDFLOWERS
A New Book to Buy

Missouri Wildflowers, by Edgar Denison, published by the Missouri Department of Conservation, is available at the Garden Gate Shop at the Main Gate, and Visitor Center at the Arboretum.

The book, a field guide to wildflowers of Missouri and adjacent areas, presents 250 flowers in color photographs, and contains written descriptions of an additional 150 wildflowers.

All plants shown and described in the book grow within the boundaries of Missouri. Common names and botanical names are given for each flower in the book, along with information about the time of blooming, habitat, and distribution within the state.

The flower pictures are arranged by colors to make identification as easy as possible. As an aid in locating the various color groups a color index tab is on the margin of the picture pages, making it very easy to use the book when in the field.

Mr. Denison said, "The book has been prepared to help the casual flower watcher as well as those more advanced in the delightful avocation of getting acquainted with our native wildflowers."

Mr. Denison has often led groups on wildflower walks at the Arboretum. We are looking forward to two special days for the Membership, one in April, and another in May when he will again lead the tours at the height of the wildflower season. More information on these events will be mailed to the Members in the near future. □

The MISSOURI BOTANICAL GARDEN BULLETIN is published 10 issues per year monthly except January and August, by the Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Mo. 63110. Second class postage paid at St. Louis, Mo.

SUBSCRIPTION RATES:
$5.00 per year. $6.00 foreign.

APRIL GARDENING

Much color is found in gardens this month. This is a good time to look at the spring bulbs and make notes on where to add others next fall. When flowers are through blooming, cut just the flower head off (no leaves) so as to let the bulb now produce food for the new bulbs for next spring's color. Work bonemeal in lightly around the bulbs.

Ventilation in the cold frame and small greenhouse is very critical to avoid a build up of heat. Some shading may be necessary to prevent burning. Watch and control insects; they can build up quickly now unless controlled. Space plants for good air circulation and step up feeding to encourage good growth. Pinch plants to encourage more branching.

Vegetable planting should be stepped up to get most things in the garden. Only very tender plants such as tomatoes, beans should be held up until later.

Summer bulbs such as gladiolas should now be planted at 3-4 week intervals to insure a continuation of color for later in the summer. Many of the hardy annuals may be set out in soil well prepared with organic matter and bone meal.

Lawn areas not reworked and seeded last month should be done immediately. More attention to watering will be needed from now on. Keep lawn mowed regularly and be prepared to raise the mower as weather gets hotter; cutting too close in hot weather hurts the lawn. Short plants can't manufacture food and thus grass becomes thin, letting weed seed in. Fertilizer should be applied now, if not done in late winter.

Roses should have all the mulch removed. Add organic matter to beds and feed about one cup of bonemeal to each plant. Complete pruning of roses before growth becomes active. Be careful to prune out all weak and dead growth, and lead good canes back to proper height and an outside eye. New roses should be set out immediately and kept well watered until growth commences.

Ground covers such as ivy, euonymus, pachysandra, etc., if they have become leggy and open, benefit by shearing back early this month. To do this, raise the mower up so it cuts no closer than 5 to 6 inches from the ground and mow over the ground covers. Remove cut ends and apply a good, balanced fertilizer to overall area.

New plantings of trees, shrubs and evergreens should be completed this month. Stake if needed and apply mulches around each plant to a depth of 3 to 4 inches to conserve moisture and prevent weeds.

Azaleas and rhododendrons should have all dead and broken ends cut off. Feed with acid fertilizer or cotton seed meal. If plants are a light green color (Chlorotic), feed with iron. Don't cultivate around the base of these plants as they are surface rooting, but add mulch to prevent weeds and conserve moisture.

Evergreens and other shrubs should be checked for winter injury. Prune out dead or broken branches and work in bone meal and a good, balanced fertilizer. Apply mulch as suggested earlier.

Wood ashes saved from the fireplace may be now broadcast on the garden around lilacs, delphiniums, mums and columbine. Wood ashes help to deter slugs and cutworms. □

1973 ALL-AMERICA AWARD WINNING ROSES AVAILABLE FOR SPRING GARDENS

Seldom have three new roses received more favorable comment than the trio of tea roses which swept the AARS awards this year. Large beds of them bloomed in all of the 112 AARS accredited public Rose gardens throughout the nation all last summer and gave top performance from coast to coast.

The Garden is one of the official AARS rose test gardens in this country, and the three award winners for 1973 can be seen growing in the north rose garden.

MEDALLION (Plant Patent 2997) has by far the largest individual blooms of the three, reaching, in some areas, the huge diameter of seven to eight inches. The very broad, heavy 35 petals making up the bloom are a distinct, soft apricot-pink, varying in intensity with the weather, but always maintaining

their pleasing pastel shadings.

MEDALLION blooms have a mild, subtle, fruity fragrance, and are borne usually individually on 12-18 inch stems. The shapely, two to three inch, long pointed buds open to roses that vary greatly in color with the season — delicate apricot buff in the spring and summer, gradually deepening and adding pink until, in the cool fall weather, MEDALLION becomes definitely a distinct apricot pink.

The plant has a good resistance to the rose diseases, and is lightly thorned. The blooms last well on the plant, aging attractively and dropping cleanly.

GYPSY (Plant Patent Applied For) has everything that could be desired of a good garden rose — strong growth, bushy plants, numerous blooms at all times, and a brilliant scarlet color.

GYPSY bears its continuous bloom on a growing plant of average height. The classic, urn-shaped flower buds are held on long, sturdy, stems, and unfold to large, fully double roses of slightly cupped form. Their brilliant color is retained throughout the life of the bloom, regardless of weather. The roses have a light, spicy fragrance, over 36 petals, and are usually borne one bloom to a stem.

The foliage is large, leathery, glossy deep green, and has very good resistance to mildew and rust.

ELECTRON (Plant Patent Applied For) has large, bright, rose-pink blooms that, on a dull day, seem to have a neon glow of their own to brighten them up.

The plants are vigorous, bushy, broad, and well shaped with an abundance of dark green foliage. On this framework, the very large and very fragrant blooms are thickly set, singly or in clusters, during the entire blooming season.

The buds are strikingly deep, deep rose pink, opening to fully double, high-centered flowers that hold their color well in all stages of development. When cut, the fragrant, open blossoms are long-lasting. ☐

SPRING BULBS IN BLOOM AT THE GARDEN

Last fall approximately 20,000 Spring bulbs were planted in various parts of the Garden and can be seen flowering from now through mid-May. Numerous small bulbs suitable for the rock garden or other hot, dry areas of the garden can be seen flowering in front of the new Mediterranean House. Tulips and daffodils are featured in various areas throughout the Garden.

The Perennial Gardens, which were redone last fall, feature many varieties of tulips such as Cottage, Darwins, Darwin Hybrids, Parrot tulips and others, which will be starting to flower shortly; tulips have been massed throughout the Knoll area. The various bulbs are labelled, showing the variety name; some have only numbers as they are so new that names have not been given as yet. But, the amateur or ardent gardener will find plenty of scope for his or her home garden for planting next fall. ☐

FRESH HERBS FOR THE GOURMET

Siegbert Muthofer, Executive Chef of Food Service Management, Inc., clipped fresh herbs in the Herb Garden at the rear of Tower Grove House, to take with him to Frankfurt, Germany, last fall. Siggy was one of the eleven members of the United States Team which participated in the Culinary Art Olympics of 1972. Thirty-seven countries were represented in the competition; 37,000 different foods were displayed, and 3/4 million people attended.

Siggy returned with a gold medal. He feels that the use of fresh herbs in his entries was a major reason for his success. The United States was the grand winner of the 1972 event, capturing a total of seventeen gold medals.

The Herb Garden, just outside the kitchen door of Tower Grove House at the Garden, is maintained by the St. Louis Herb Society. ☐

St. Louis Herb Society
ANNUAL PLANT SALE

The 14th annual plant sale of the St. Louis Herb Society will be held Saturday, April 28, 1973 from 9 a.m. until 4 p.m. in the Floral Display House at the Garden.

Approximately fifty varieties of the most desirable culinary and housekeeping herbs will be available from 14,000 plants. Most of these herbs have been grown in the Garden's greenhouses where Herb Society members work on a volunteer basis year round one day a week.

Proceeds from the sale are for the benefit of the Garden's greenhouses. As the interest in herbs has increased, the number of plants supplied has grown over the years, from a few hundred to its present total.

Customers are asked to bring boxes or baskets in which to carry their purchases.

No advance mail or telephone orders can be filled. ☐

COMPANION PLANTING

"Companion Planters" who are looking forward to the annual sale of the St. Louis Herb Society will find the following list helpful.

A few plants have properties which enable them to repel certain insects. These plants when planted in combinations with others prove to be an effective method of organic insect control. A few of the common combinations are:

Chives or garlic: near lettuce or peas, against aphids
Garlic: near roses, against blackspot, mildew, and aphids
Geraniums: among roses or grapes, against Japanese beetles
Odorless marigolds: near corn and roses, against Japanese beetles
Marigolds: near cucurbits against cucumber beetles
Nasturtiums: near beans, against Mexican been beetles; near broccoli, against aphids; near cucurbits, against striped cucumber beetles and squash bugs
Parsley: near roses, against rose beetles
Potatoes: near beans, against Mexican been beetles
Radishes: in hills of cucurbits, against striped or spotted cucumber beetles
Rosemary, sage, thyme, nasturtium, catnip, mint, hemp or hyssop: near cabbage, against white cabbage butterflies
Tansy: around cabbage plants, against cabbageworms and cutworms
Tansy, garlic or onions: around peach trees, against borers ☐

THANK YOU TO LAFAYETTE FEDERAL

The Garden sincerely thanks Lafayette Federal Savings and Loan Association, for honoring the Missouri Botanical Garden during the month of April.

Lafayette Federal is celebrating their one-hundredth birthday by saluting cultural institutions within the St. Louis area. ☐

Dr. Dwyer (right) and guest

RUSSIANS VISIT GARDEN

Five Soviet heart specialists accompanied by two St. Louis University doctors visited the Missouri Botanical Garden on February 19. The Soviet doctors were at St. Louis University School of Medicine as part of a US-USSR Health Exchange Agreement (signed by President Nixon during his visit to Moscow) to plan a cooperative research attack against coronary heart disease.

Dr. Vallee L. Willman, a member of a four-man U.S. heart expert team which visited Russia for two weeks in September, hosted the Russian doctors at St. Louis University. He is professor and chairman of the Department of Surgery at St. Louis University School of Medicine.

The Soviet delegation began their two week U.S. visit at Bethesda, Maryland, February 4, where they attended the conferences at the National Heart and Lung Institute. From there they flew to Birmingham, Alabama to visit the University of Alabama; then, to San Francisco to attend the annual meeting of the American College of Cardiology. They arrived in St. Louis February 18 and spent two days touring the Medical Center facilities and enjoying the cultural aspects of St. Louis.

At the Garden the team was welcomed by Dr. Raven and then Dr. John Dwyer, Professor of Biology at St. Louis University and Research Associate at the Missouri Botanical Garden, took them on a tour of the Garden. The tour included viewing the greenhouses, the Climatron, the grounds, and the research facilities in the Lehmann Building. □

CALENDAR OF EVENTS

Special Events

April 1-22	Spring Flower Show Floral Display House
April 13	Spring Gardening Lecture Growing Center — 10:30 a.m.
April 18	Members Day at Arboretum
April 25	Botany Lecture, "Tropical Hummingsbirds and Some Unbidden Guests" — By reservation. Dr. Robert K. Colwell, University of California. Auditorium — Lehmann Bldg. 8:00 p.m.
April 28	St. Louis Herb Society Plant Sale — Floral Display House 9:00 a.m. — 4:00 p.m.
May 6	Members Day at Arboretum

Adult Classes (Reservations only)

April 4 & 11	"The Shape of Things to Come" (course on pruning) — 10-11:30 a.m. New Growing Houses — Instructor: Robert Dingwall — Fee: $8; Members, $6.
April 14	"Home Orchid Culture", 10:00 a.m. — 3:00 p.m. New Growing Houses — Instructor: Robert J. Gillespie. Fee: $10; Members $8
May 2, 9, 16, 23	"Tree Leaf Identification", Lehmann Building — 1:00 — 3:00 p.m. Instructor: Kenneth Peck — Fee: $12; Members $9

Children's Saturday Nature Study

10:00 to 11:30 a.m.	Lehmann Building
April 7	"Sowing Seeds" — Fee: $.50 (Bring rigid container)
April 21	"Plants of the City" — Fee $.25
May	"Transplanting Seedlings" — Fee: $.50

The Missouri Botanical Garden
is a Fund Member of

The Arts and
Education Council of
Greater St. Louis

NEW LIFE MEMBER OF THE GARDEN

Mr. James W. Haegen

The Garden is grateful to Mr. Haegen for his Life Membership gift to the endowment, and to the following new annual members:

Mr. & Mrs. David C. Arnold
Mr. & Mrs. Donald A. Azar
Mrs. Charles M. Babington, Jr.
Miss Gloria Bauer
Mrs. Edwin Bennett
Mr. & Mrs. Paul Brackman
Mr. & Mrs. Charles Brandhorst
Mr. & Mrs. Paul J. Brauch
Mr. J. W. Brown
Mr. & Mrs. Arthur S. Buchanan
Mrs. Thomas Clark
Dr. & Mrs. Nicholas J. Colosi
Mrs. David A. Connell
Mr. Joseph J. Costello
Mr. & Mrs. R. L. Cronk
Mrs. Rosalie Dielmann
Mrs. Claude L. Douthett
Mr. & Mrs. Henry G. Drosten
Mr. & Mrs. Leo A. Eason
Ms. Lyn Eggert
Mr. & Mrs. John N. Ehlers
Miss Barbara C. Elftman
Mr. & Mrs. John Ellis
Mrs. Virginia T. Ernest
Mr. John L. Everitt
Mr. & Mrs. Tom H. Faerber
Mrs. R. S. Feinstein
Mr. & Mrs. Norman A. Fishel
Mrs. C. N. Garland
Mrs. Calvin Gatch
Miss Gladys M. Gerdel
Mrs. Gerard W. Gerhart
Mrs. Gloria J. Gewinner
Mr. & Mrs. Joseph Giangiacomo
Mr. & Ms. Thomas Gosebrink
Mrs. Samuel B. Grant
Mr. & Mrs. Dustin H. Griffin
Dr. & Mrs. Willis C. Gross, Jr.
Mr Larry A. Haas
Miss Charlene Habermehl
Mrs. Mae J. Hamilton
Mrs. Lucille G. Harper
Miss Naomi V. Harrington
Mr Jack Haupt
Mrs. Sandra Hitschler
Dr. Frances L. Horvath
Mr. & Mrs. William R. Hostetler
Mrs. Richard D'Oyly Hughes
Dr. & Mrs. F. Edmund Hunter, Jr.
Mr. & Mrs. Martin W. Imber
Mr. Clayborn L. Jackson
Miss Georgene Jenkins
Ethel S. Johnson
Mr. & Mrs. James Lee Johnson, Jr.
Mrs. William T. Jones, Jr.
Mrs. Elmer Karius
Mrs. Hank Klepacke
Mr. Marvin Kling
Mr. & Mrs. Richard B. Kobusch
Miss Camilla Kotrba
Mr. & Mrs. Fred M. Lanz
Mr. & Mrs. Theodore F. Lesch
Mr. L. C. Lippincott
Mr. John R. Loomis
Miss Terry M. Lynford
Mrs. Ann McCord
Mrs. A. R. Maier
Mr. & Mrs. Ross W. Marré
Mr. & Mrs. Ronald J. Martin
Mr. & Mrs. Roy Meyer
Mr. Kenneth A. Miesner
Mr. & Mrs. Kenneth M. Moody
Mr. & Mrs. Peter H. Mosbacher
Mr. & Mrs. Dennis E. Nelson
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Mrs. Richard Platt, Sr.
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Mr. & Mrs. Joe Reiss
Mr. & Mrs. Wayne Reynolds
Mr. & Mrs. O. Richmeyer
Miss Ann Riesmeyer
Mrs. Eddy J. Rogers
Mr. & Mrs. Fred F. Rohne
Mr. & Mrs. John L. Rollo
Ms. Connie Rosenbaum
Mr. & Mrs. Leonard A. Sanker
Mrs. Joseph Schraibman
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Mr. & Mrs. Robert J. Wilkison
Mr. & Mrs. Fred W. Winterowd
Mr. & Mrs. Howard L. Wood
Miss Sallie S. Wood
Mr. & Mrs. Andrew R. Zinsmeyer
Dr. Conrad J. Zoeller

RHODES – HIGH ABOVE THE SEA

1973 Trip for Members of the Garden

Praised by the poets as the "Island of Roses" and "Bride of the Sun," Rhodes is the largest and most beautiful of the Dodecanese Islands. You'll see the wisdom of the poets' words when you visit Rhodes during our Mediterranean Adventure Air/Sea Cruise next October. And Rhodes is just one of the ports of call you will visit while cruising the Mediterranean and Greek Islands aboard the Paquet luxury cruise liner, Mermoz. A few of the many exclusive features offered on the vacation value are: Direct chartered private jet flights, all meals of the finest French cuisine, Cruise Director and full staff to assist you at all times, daily optional shore excursions and never any regimentation – do as you please when you please! All at low charter cost savings – from $895. But you'd better hurry. Space is strictly limited! If you haven't done so, make your reservations today.

MISSOURI BOTANICAL GARDEN BULLETIN
2315 Tower Grove Avenue
Saint Louis, Missouri 63110

SECOND-CLASS
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**SAVE
SATURDAY JUNE 2
SAINT LOUIS
SYMPHONY
ORCHESTRA
PERFORMS AT
MISSOURI
BOTANICAL
GARDEN
7:30 P.M.**

Missouri Botanical Garden Bulletin

SAINT LOUIS SYMPHONY ORCHESTRA at MISSOURI BOTANICAL GARDEN

Saturday, June 2, 1973 at 7:30 p.m.

The Missouri Botanical Garden is pleased to announce that the Saint Louis Symphony Orchestra will perform outdoors at the Garden, in the lovely setting south of the Climatron, on Saturday evening, June 2. The Garden will open at 6:30 p.m., so that concert goers may enjoy the beautiful spring flowers before the performance.

Associate Conductor Leonard Slatkin will conduct the symphony orchestra. The program includes *Adagio* by Albinoni, *Contra Dances* by Beethoven, *Siegfried Idyll* (Original Version) by Wagner, and *Creation of the World,* by Milhaud.

The interesting program spans musical styles of three centuries, from Baroque through the Twentieth Century. The Albinoni *Adagio* was originally written for strings and organ. Mr. Slatkin has transcribed the piece for small orchestra of strings and winds. This performance at the Garden will be the premiere of his transcription.

Admission, at gate only, is $2.50 for adults; $1.50 for children. Please bring a blanket or chair. This concert is supported, in part, by a grant from the National Endowment for the Arts.

LEONARD SLATKIN

Conductor

Leonard Slatkin, associate conductor of the Saint Louis Symphony Orchestra, at 28 years of age is one of the youngest musicians in the United States to hold such a position with a major symphony orchestra.

Mr. Slatkin began his musical studies as a child in a household in which music-making was a constant activity. His father, the late Felix Slatkin, was a celebrated conductor and violinist, and a member of the Saint Louis Symphony violin section for several years. His mother, Eleanor Aller, is a renowned cellist; they founded the Hollywood String Quartet. Mr. Slatkin studied conducting with his father, with Jean Morel at the Juilliard School, and with Walter Susskind at Aspen.

Mr. Slatkin began his professional career as a pianist, playing numerous recitals with his brother, a cellist. He made his conducting debut in Carnegie Hall when he was 22, performing with the Youth Symphony Orchestra of New York. In 1968, he came to St. Louis at Maestro Susskind's invitation as assistant conductor; he was elevated to his present position in the fall of 1971.

With the Symphony, Mr. Slatkin conducts several regular subscription concerts each season, the Sunday Festival of Music Family and Spectrum Series, dozens of educational concerts for children and young people, and serves as music director and conductor of the Saint Louis Symphony Youth Orchestra which he founded three seasons ago. He also conducts several of the outdoor concerts in the Spring and at the Mississippi River Festival on the University of Southern Illinois campus in Edwardsville.

He has guest conducted orchestras throughout the United States. Recent guest conducting engagements include the Los Angeles Philharmonic, Chicago Symphony, Baltimore Symphony, Minnesota Orchestra and Glendale Symphony (at the Music Center in Los Angeles).

Volume LXII Number 4
May, 1973

SURVEY OF THE GARDEN COMPLETED

Roy Leimberg, President of the Pitzman Company, submitted the twenty-two sheets which make up the completed survey of the Garden to Dr. William Klein, on April 16. The finished map represents the culmination of a project which began on October 24, 1972. Field work was concluded on January 23, 1973, and this was followed by many hours of labor over a drafting board reducing the figures to lines and dots on a map.

There have been many maps of the Missouri Botanical Garden – the first drawn by Henry Shaw. A "Guide Map" of the Garden dated 1904 was drawn up by the Olmsted Brothers; and John Noyes, the noted landscape architect who designed the Linnaean Gardens and Knolls, drew a general plan for the Garden on a map dated 1917. These very interesting maps are on display in Tower Grove House and in the map file of the library. As various features were added to the Garden, the changes were not always depicted on existing maps. Until the present survey, all of the physical features of the Garden had never been brought together and presented on one map.

Specifications for this map were drawn up by Environmental Planning and Design, the Pittsburgh firm which is developing the Master Plan for the Garden. These specifications called for a map which would show the relief on a one-foot contour interval, and that all trees of four inches or more in diameter be plotted. Each tree had to be identified, and the identification indicated on the map. A crew from our Horticulture department tagged all of these trees.

Buildings and walkways were also plotted, as were all the underground utility lines. Location of these utility lines was not always simple; many of them had been abandoned over the years and had never been accurately represented.

This invisible portion of the Garden provides the life support to the grounds and various plantings, and it was necessary to gather many bits and pieces of information that had been accumulated over the years on scraps of paper. Jim Hampton's long experience at the Garden proved invaluable in transferring this information onto the map.

The Pitzman Company is to be commended for the fine job they did on this unusual survey. This survey brings into sharp focus the great diversity of plant life in the Missouri Botanical Garden. □

FAMILY DAY at the ARBORETUM

Sunday, May 6

The members of the Garden and their families are cordially invited to visit the Arboretum, in Gray Summit, Mo., on Sunday, May 6.

From 10:30 a.m. until 3 p.m. the following events will take place, continuously, for members only.

Bus tours – buses will tour the grounds of the Arboretum, as naturalists of the Arboretum staff explain the natural communities within the Arboretum. The bus will stop at the Trail House, and passengers may complete their tour on the return to the parking area.

Meet Edgar Denison – author of *Missouri Wildflowers,* at the Trail House, where he will autograph copies of his book. Mr. Denison has been interested in conservation in the state of Missouri for many years. Now retired from Union Electric Company, he designed the Missouri Natural History Museum located at the Taum Sauk plant. An artist, photographer, and author, he is donating all proceeds from the sales of his new book to the Missouri Conservation Commission. Mr. Denison will answer questions about flowers which you find, as you and your family take "self-guided" hikes along the wildflower trails.

Horticulture Walks – walking tours of the Pinetum, led by members of the Horticulture staff. The Pinetum contains 100 acres of species of conifers collected from around the world, and planted at the Arboretum during the 1930's to study their adaptability to the St. Louis environment. The plantings offer ideas for horticultural display and landscaping.

Movie "Daffodils" – a film showing the experiences of a child from the city as he discovers the world of nature at the Arboretum. Shown at the Trail House, lower level.

Picnicking is allowed, but at designated table areas only. No fires, please. With the completion of I-44, the Arboretum is now an easy drive of less than an hour from any part of the St. Louis area. It is located 35 miles southwest of St. Louis on I-44. Exit at Gray Summit, cross over the highway and turn right. The main gate is to the left. The gates are open every day from 8 a.m. until 5 p.m.

CLIMATRON POOL REDESIGNED

The tropical pool in the Climatron has undergone complete renovation during the winter. A vivid presentation of an underwater environment, typical of a tropical rainforest, can now be seen from the aqua tunnel.

Renovation and underwater landscaping of the pool was made possible by a generous gift from Mr. and Mrs. Robert R. Hermann in memory of their daughter, Christy Busch Hermann.

Mr. Hermann is a member of the Garden's Board of Trustees.

The design and construction work was performed by Marvel Pool Company. Naturalistic topography was achieved with the use of pumice rocks. The rock has been incorporated into planter areas and islands, and has also been used to create enclosures for the new indirect lighting system.

The planters now contain a large collection of aquatic plants which include submerged, floating-leaved and emergent types. Some of the oxygenating plants that may be observed on the lower tiers in the pool are the feathery *Cabomba, Myriophyllum,* and hornwort; the sword-like *Sagittaria* and *Vallisneria,* and *Elodea.* The broad-leaved Amazon sword plants, *Aponogeton, Thelanthera* and *Hygrophila* occupy cliffed planter areas on the intermediate levels. The bog or shallow-water plants inhabit those levels just below the water surface. Zebra rush, Chinese water chestnut, water canna and *Ludwigia* emerge from the water to display their attractive foliage textures while parrots feather, creeping primrose, water snowflake and floating heart can be found on the water surface.

One of the islands in the tropical pool is a display area for tropical hermit crabs. Their "shell houses" are scattered on the sand-filled island. These small crustaceans formerly occupied the display case adjacent to the pool, but were moved to the island, which provides a more natural surrounding.

Through the concerted efforts and donations of Famous-Barr Pet Department, tropical fish have now been reintroduced. However, restocking the pool has been a gradual and careful procedure to insure proper specie existence and compatibility. So far the results have been quite favorable, with very few losses. Such fish as angel fish, buck-toothed tetras, tropical catfish, firemouths, tinfoil barbs, giant danios, discus, and an enormous gray gourami named "Lobo" populate this vast, 32,000-gallon aquatic world.

Observation from the aqua tunnel has been improved by the expansion of the existing water filtration system. Two additional filters have been installed and now fresh, filtered water is distributed throughout the entire pool. Algae growth in the water has also been curbed with the use of an experimental algicide. Water clarity should no longer be a problem.

"Water activity" is another new and interesting feature in the tropical pool. Two fountainheads now spray water over the aqua tunnel, thus creating the effect of water in motion. Also, an aeration system has been installed to produce air bubbles around the islands and provide additional oxygen for plants and fish.

We invite you to come and explore this exciting underwater panorama. □

The MISSOURI BOTANICAL GARDEN BULLETIN is published 10 issues per year monthly except January and August, by the Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Mo. 63110. Second class postage paid at St. Louis, Mo.

SUBSCRIPTION RATES:
$5.00 per year. $6.00 foreign.

Gardening in St. Louis

GARDENING IN MAY

The spring rush of garden chores the past month is beginning to let up and gardeners are now moving into the more routine tasks of the summer. The rewards of earlier planning and planting are now apparent and mistakes or errors in judgment are revealed.

Keep a notebook and keep it up to date. Now is the time to enter in it your evaluation of the garden results attained this spring, with notes on changes or improvements. Make a note of those special bulbs or plants you noticed in the Garden (MBG), or friends' gardens, that you wish to add to yours next fall.

Prune back forsythias and other shrubs which have finished flowering, to shape the plants up and control the size. Remember these plants form the flower buds that you look forward to seeing this summer. Leggy azaleas and rhododendrons need to be pruned back also. If fertilizer was not applied earlier to these shrubs, do so now with cottonseed meal and bonemeal. Work in lightly and apply more mulch around the shrubs to control moisture and weeds.

Grass should not be cut closer than 2-2½ inches in the warmer weather. This allows the plants to manufacture food in sufficient quantities to continue in good health, and also prevents weed seed that needs light for germinating.

Continue to inspect plants regularly to see that insects and disease do not become problems. Rogue out weak or diseased plants. Use sprays early in the morning and when there is little or no wind to prevent drifting. Safe sprays are Rotenone, pyrethrum and, if necessary, Malathion, but follow the directions on the labels carefully.

Spring flowering bulbs should not have the foliage removed until the leaves start to turn yellow, usually 5-6 weeks after flowering has stopped. If foliage is removed too early, little or no flowering will occur next year.

Continue to plant annuals in the garden for all summer color. Select healthy, sturdy plants, water in well when setting out and, if necessary, protect from hot sun for first day or two. Good annuals for hot, dry areas are California poppies, gazanias, African daisies (several types), portulacas, gerberas. Plants for shaded areas are impatiens, coleus, fibrous begonias and caladiums. Prepare soil well by adding lots of humus in the form of compost, rotted manure, or peat moss, and 5 lbs. bonemeal per 100 square feet.

Water the garden early in the day, if possible. Water heavily so that each area receives the equivalent of 1-2 inches of water every 10 to 14 days. Avoid light waterings every day or so, as this tends to bring the roots to the surface, causing plants to suffer and even die.

Remove spent blooms on roses and other perennials; if allowed to produce seed, the plants suffer and become weak. Some perennials such as arabis, candytuft, alyssum and early phlox, need to be trimmed back hard after flowering to prevent the plants from becoming leggy. Add annuals to the perennial beds for constant color and cutting for the summer.

Continue planting of gladiolus corms at three-week intervals to give a succession of bloom. Keep well watered for best growth.

House plants can now be moved outdoors for the summer. Repot first if necessary and cut back to encourage new, sturdy growth.

Chrysanthemums can now be divided, or new cuttings made and reset for the best effects in the fall. Pinch back to encourage good breaks and to help control growth.

Early vegetables are now ready for harvesting and second sowing can be made as space is available. Set out tomatoes and stake to conserve space. Mulch applied helps to control weeds and moisture.

Container grown nursery stock may be set out at any time, but proper soil preparation is necessary as is heavy watering at regular intervals. Mulch 3-4 inches to control temperature and moisture.

The home greenhouse is now nearly empty since most plants have been moved outdoors. Clean all benches and floors thoroughly. Apply extra shade if necessary and watch watering to prevent drying out. Give as much ventilation as possible, day and night. If plants have been grown in benches, remove all old soil and prepare with fresh soil. Large plants such as citrus and others, may need some pruning to control growth and improve the plants. Continue to feed at regular intervals with liquid fertilizer.

This is a good time to consider constructing a home greenhouse. When fall comes, the pleasure of growing things can continue indoors. Why not begin by reading this new book? ☐

Greenhouse Gardening (2nd edition) by Henry T. Northern and Rebecca T. Northern, New York, Ronald Press, 1973. 388 p.

This volume, a complete revision of the authors' *Complete Book of Greenhouse Gardening* (1956) is an important addition to the library of anyone who has, or plans to construct, a garden under glass, or for those interested in plant propagation. The book begins, quite logically, with instructions on the selection and building of the home greenhouse and progresses to a discussion of such essential topics as soils and fertilizers, the growing of plant from seeds or cuttings, identification and control of common hothouse pests and diseases, and the cultivation of flowering and foliage plants. The last half of the book is devoted to chapters on the cultivation, propagation, and care of specific groups of plants in the greenhouse environment (begonias, orchids, gesneriads, succulents, even bulb plants and vegetables). The Northerns, already well-known for several other books on botany, gardening, and orchids, are to be commended for providing accurate and easily understandable instructions on all aspects of the use and maintenance of the home greenhouse, supplemented with excellent illustrations to clarify information provided in the text. □

ROSES

The rose is a lovely lady, and if you are kind and attentive to her, she will fill your garden with a generous abundance of color and form.

Remember, she is a fairly hungry plant and regular feedings will stimulate growth and make her bloom. But don't overdo it; three feedings of a good, balanced rose food a year should be enough, or perhaps a light feeding once a month. A good plan is to consult the recommendation of the manufacturer, which is printed on the container.

To keep her free from pests and diseases, a regular spray program is best, say every two weeks with Phaltan or Manzate for blackspot, and Benlate for mildew, being sure to cover the plant — especially the underside of the leaves.

Roses require a lot of moisture, and in dry weather a weekly soaking is recommended. Morning is the best time for watering. This gives the foliage all day to dry off, discouraging disease. Most rose literature advocates some method of watering to keep water off the leaves. However, if you do water leaves and all, follow up with a spray of Phaltan or Manzate and Benlate.

Since the chief function of a rose is to beautify, keep her neat and trim by regular pruning. This is done by cutting off all faded flowers, and if it is a husky plant, cut just above a five-leaf cluster of leaves. If it is a rather weak or new plant, do not cut away any more wood than necessary, even if you cut to a three-leaf cluster, or just the faded bloom. Of course, sucker shoots that come from below the bud union must be removed.

Deep cultivation of roses should be done only in early spring, but to avoid hard or packed soil, cultivate shallowly for the rest of the season.

To discourage cane borers, which are active the entire growing season, seal ends of canes after pruning with pure orange shellac or cane sealer.

One of the real secrets of rose growing is sunshine. Roses must have a half-dozen hours of sunshine in the early part of the day and shade from the hot afternoon sun.

It has been said if you pick a spot where you would be comfortable sitting out all day and plant a rose there, you will keep this lovely queen of the garden happy and blooming.

Mulching is an important item for the rose grower to consider, for not only does it discourage weeds, but it conserves moisture in the soil and helps keep the root area cool. For this purpose, ground corn cobs are excellent as they are least expensive and do an adequate job of holding moisture in the soil. Our preference, however, is old cow or horse manure, which adds humus to soil that roses need. Grass clippings may also be used.

One of the most troublesome rose pests is the red spider mite. These tiny creatures, pinkish when young and yellow or green when mature, pierce rose foliage and suck, leaving a webby deposit on the underside of leaves. The mites themselves are all but invisible with the naked eye. A bad infestation may cause defoliation. Our advice is to assume they are there in early spring and spray with Kelthane,May 25, being certain to get to the underside of the leaves, otherwise your efforts will be of little avail.

Do not get excited about a few aphids unless 50% or more of your plants are affected. Leave them to the ladybugs, who regard them as choice food. If they become too numerous, a generous spraying of Malathion will put an end to their career. □

The rose gardens at the Missouri Botanical Garden contain more than two thousand plants, and present a magnificent spectacle in late May, when in spring bloom. Alfred Saxdal, rose grower for the Garden, is responsible for their beauty.

A native of Denmark, Mr. Saxdal studied at the State Horticultural Experimental Station, Hornum, Denmark. He came to the United States in 1927, and to the Garden in 1963. His greatest ambition is for our Garden to have the very best rose gardens in the United States.

This column on growing roses in St. Louis was written by Al Saxdal. It is obvious that his personal feeling for his "ladies" is the reason for his success.

Come to the rose gardens this May. Watch Mr. Saxdal at work, and study and observe. Try his methods in your garden. □

THE NATURE CONSERVANCY

The law doth punish man or woman
that steals the goose from off the commons,
But lets the greater felon loose
that steals the commons from the goose.

Author unknown
c. 1764

This wry comment on misdirected conservation priorities remains as appropriate today as in the 18th century. The enormous rate at which we are destroying wild habitat, is leading to the extinction of plant and animal species at an alarming rate. It has been estimated that, projecting present rate of environmental disruption, fully 80-85% of the species of organisms presently living on earth will be extinct before scientists have even recorded their existence. This presents a rather distressing statistic if we take at all seriously the ecologists' understanding of the intricate balances responsible for the maintenance of life on earth.

Saving species ultimately boils down to a strategy of saving habitats, and one of the most unique and effective land conservation organizations working in the United States today is the Nature Conservancy. With a conservation philosophy guided by a sound understanding of current ecological issues, the Conservancy's strategy is to apply formidable business skills in tax law, finance, and real estate, to transfer threatened lands from private development to public protection. Nationally the Conservancy has saved over one-quarter million acres, in relatively small but highly critical parcels.

Their quiet behind-the-scenes efforts have secured for our future use and enjoyment such areas as Patagonia-Sonoita Creek bird sanctuary in Arizona; sections of coast and coastal islands in Maine; prairies in Illinois, Missouri and Kansas; wildlife sanctuaries in Georgia and Florida; and fifty thousand acres of the Great Dismal Swamp, an important wildlife area in Virginia. The Missouri Chapter has been active throughout the State of Missouri in saving a variety of important natural areas, including Lichen Glade in St. Clair County; Loess Mounds, an outstanding example of loess deposits along the Missouri River in Holt County; Osage Prairie, one of the few large tracts of natural prairie remaining in Missouri; a nature preserve in Jefferson County containing one of the largest known caves of the northeastern Ozarks; and various forest preserves scattered throughout the state.

The Nature Conservancy understands the ecologists' admonition that destruction of natural features is an irreversible process. If any natural areas are to be left for the future, they must be set aside now. Once spent, they are gone forever. Despite the large number of acres which have been protected by the Nature Conservancy, the group never intended to become a major land holder. The organization is designed to move quickly when an important natural area is threatened, bringing its expertise and resources to bear to insure its protection. In most cases, however, ownership of the property is immediately transferred to an appropriate conservation organization, such as a park board or game reserve. It was in this capacity as "consultant" that the Conservancy was instrumental in assisting the Garden in its recent acquisitions of property necessary for the protection of the natural beauty and function of the Arboretum in Gray Summit.

The Arboretum will host the annual meeting of the Missouri Chapter, Nature Conservancy on Saturday, May 19, 1973. Included in the day's activities will be planning sessions for upcoming projects in Missouri, a tour of the Arboretum including parcels of new property recently acquired with the help of the Nature Conservancy and a buffet dinner featuring a talk by Dr. William M. Klein, Assistant Director of the Garden. Membership in the Conservancy is not required for attendance, and all those interested in the work of this important national organization are invited to attend.

For reservations or further information please contact the local office at 1015 Locust St., #425, St. Louis, Mo. 63101 or call Mrs. Joel Massie, 993-4926. ☐

Spring bulbs did survive the frost — these tulips, at the rear of Tower Grove House, burst into color three days after the record low temperature. Late blooming bulbs will continue colorful displays through mid-May, throughout the Garden.

Charles H. Eyermann, Jr., (right) president, Lafayette Federal Savings, Dr. Peter Raven, director of the Missouri Botanical Garden, and Mrs. Landon Y. Jones, president of the Women's Executive Board of the Members of the Garden, examine a Margaret Mee painting of a "Jaguar" orchid, a gift to the Garden from Lafayette Federal Savings.

Presented in a recent ceremony at the Climatron, the gift is a feature of the celebration of the 100th anniversary of Lafayette Federal Savings. Mrs. Mee, the English painter, has lived in Brazil since 1952, and has become internationally known for her water colors of the plants of her adopted country.

UNIVERSITY DAYS

May 12-13

University Days highlight the Garden's long association with higher education, in the St. Louis area. These activities are now centered in the John S. Lehmann Building, and the event comes one year after the formal dedication ceremonies, held May 12, 1972.

The thousands of friends who toured the Lehmann Building last spring at the dedication events and on Architects' Sunday remember the beauty — and the vast open space — of the building. Furnishings were yet to come, as well as the more than two-million dried plant specimens and thousands of library books.

The Lehmann Building is now fully operational, and on Saturday and Sunday, May 12 and 13, it will be open for tours. The staff will explain the operation of the herbarium and the library, and the education department will report on the programs held during the past year.

Coinciding with the completion of the Lehmann Building was the re-opening of the enlarged Garden Gate Shop. One of the exciting features of the new shop is the enlarged book room, which accommodates the most complete selection of books on horticulture, gardening and natural history in the St. Louis area. For University Days, a special "book browsers" display — of most of the books in the shop — will be held in the Museum Building.

The Garden cordially invites all college students, and faculty, to come to the Garden on University Days. Students will be admitted to the Garden at one-half the regular admission fee, upon presentation of student identification cards. □

CALENDAR OF EVENTS

Special Events

May 6	Members Day at the Arboretum
May 12, 13	University Days at the Garden
May 19, 20	St. Louis Horticultural Society Annual Show — Floral Display House — 9:00 a.m. - 5:00 p.m.
May 19, 20	Greater St. Louis Dahlia Society Bazaar — Museum — 9:00 a.m. - 5:00 p.m.
May 27	Spring Festival at the Garden
May 30	Lecture in Botany, "The Garden Through the Years" — Auditorium, Lehmann Building — 7:30 p.m. (By reservation)
June 2	Saint Louis Symphony Orchestra — Concert outdoors south of Climatron 7:30 p.m. Admission at gate: $2.50, adults; $1.50, children.
June 10	South County Art Association Display — 10:00 a.m. - 5:00 p.m. (Arts and Crafts)

Adult Classes (Reservation Only)

May 2, 9, 16, 23	"Tree Leaf Identification" — Instructor, Kenneth Peck — Lehmann Building 1:00 p.m. - 3:00 p.m. Fee: $12, Members $9

Children's Saturday Nature Study

10:00 - 11:30 a.m. — Lehmann Building

May 5	"Transplanting Seedlings" — 50¢
May 19	"Poisonous and Edible Plants" —25¢

Pitzman Summer Nature Study

June 18	Begins for eight 2-week sessions Fee: $10 (By reservation)

This summer, the Pitzman Summer Nature Study Program will offer eight two-week sessions, beginning June 18. A new session will begin each succeeding week. The first week will be held at the Garden facility in St. Louis, and the second week will take place at the Arboretum, in Gray Summit, Mo. Bus service will be provided for the study at the Arboretum.

The fee for the two-week sessions including transportation, is $15. For those children who do not need transportation to the Arboretum, the fee is $10.

For further information or reservations, please telephone the Garden, 865-0440, and ask for the Education Department Office. □

Missouri Botanical Garden
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The Arts and
Education Council of
Greater St. Louis

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Mr. & Mrs. Beecher Henderson

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Missouri
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. . . are advisors

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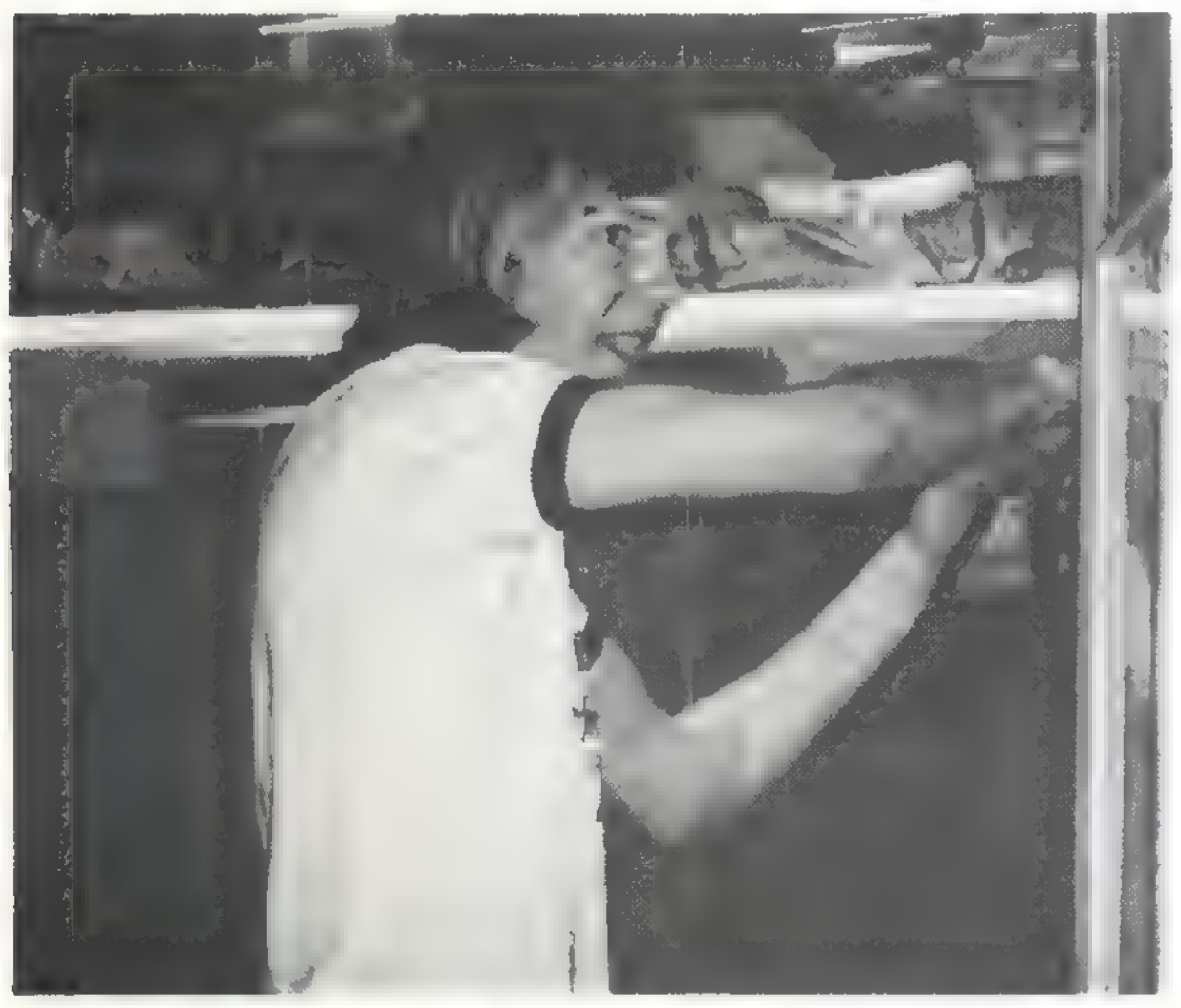
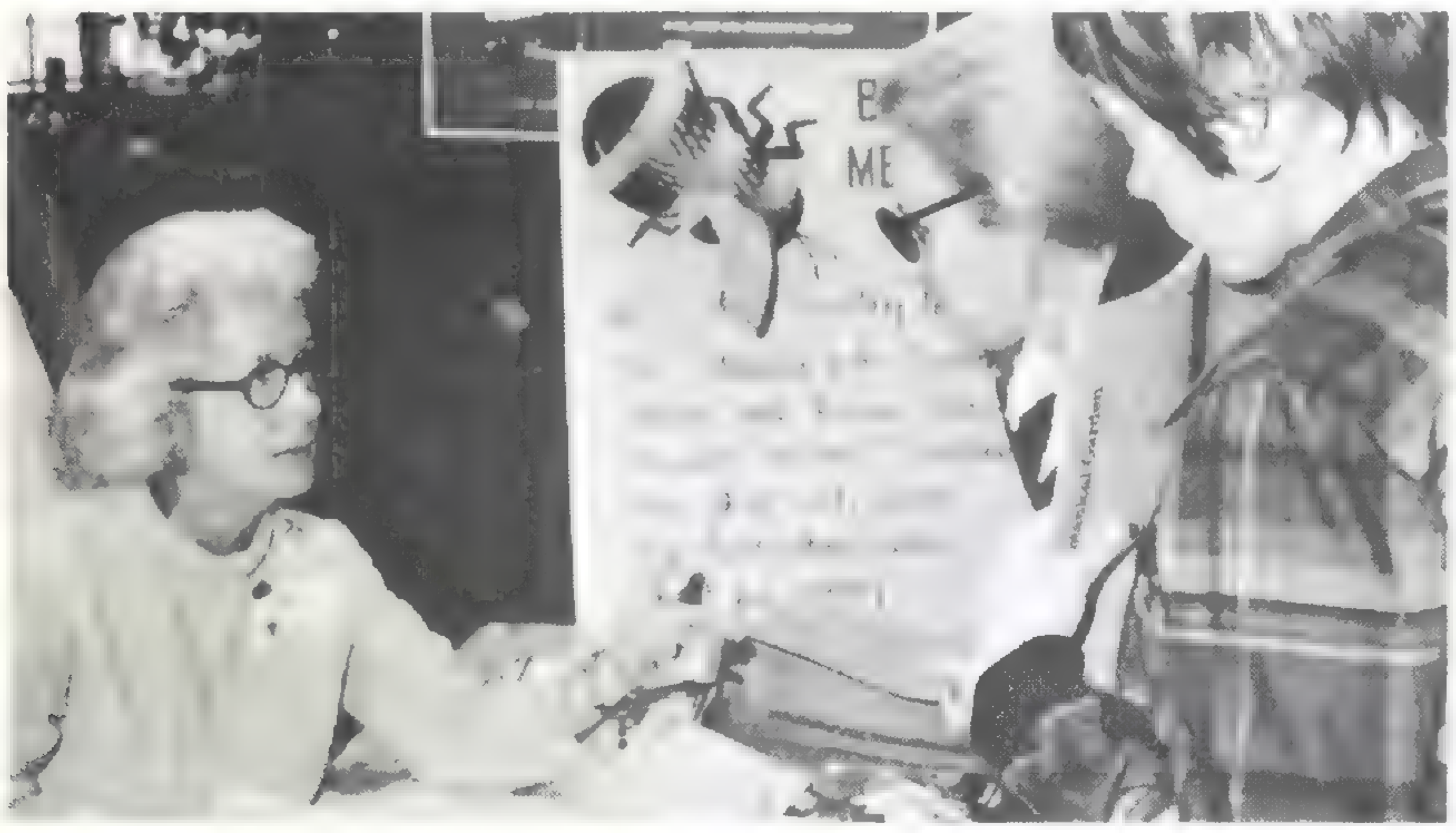


. . . work on special events

. . . sell in the Shop

. . . lead nature walks



BEE A
MEMBER

. . . support the Garden as Members and then help increase the Membership.

Volume LXII Number 5
June, 1973

VOLUNTEER – *One who offers himself for any service of his own free will.* Henry Shaw was the first, when he voluntarily established the Garden in 1859. One hundred fourteen years later, the number of active volunteers totals more than four thousand.

GARDEN GATE SHOP
CONGRATULATIONS

To Mrs. E. Lawrence Keyes, Jr., Committee Chairman, and Committee Members Mrs. Holland Chalfant, Jr. and Mrs. William A. Sims, and the more than thirty volunteer salespeople of the Garden Gate Shop. With greatest jubilation, they have announced that in their first year since re-opening, volume has doubled.

After the Shop closed for remodelling in January 1972, Pitty and her committee worked with architects and contractors, carpenters and painters and electricians, selecting paint and carpet and lighting and display fixtures, guiding the redesigning of the Shop which reopened in May 1972.

With the enlarged facilities, a "professional job" became necessary from these volunteers, The Committee selects merchandise, makes buying trips, arranges displays, takes inventory, worries about inventory, and spends hours in the Shop. They set goals, and learned a merchandise plan – and to their great credit, these goals were surpassed.

For the more than thirty regular salespeople, who are augmented by substitutes who work for special events, it meant learning to use a cash register, new stock, categories of merchandise. Special congratulations to these volunteers who are always courteous, helpful, and pleasant, for they are representatives of the Garden to the public.

Sincerest thanks to Pitty Keyes, who is "retiring" as chairman this June, and best wishes to Betty Sims, Sue Chalfant, and Margaret Baldwin, who will guide the Shop during the coming year.

A SUPER GROUP

Many individuals do special things for the Garden. Edgar Denison, the well-known naturalist, has led numerous wildflower walks at the Arboretum. Mrs. George Whitelaw, Jr., advised us on the redecorating of the Public Relations Office and Members Lounge in the Administration Building. Steven Platter, a University student, spent hours, with Dr. Klein, producing the multi-media "The Garden Through The Years."

In every department, and for every special event – Preview Parties, University Days – hundreds of people gave graciously of their time and enthusiam. Special thanks to each of them.

ADMINISTRATIVE OFFICES

Much assistance is given to the Business Office and the secretarial staff of the Directors' Offices by loyal volunteers who are always willing to help wherever needed. A special tribute to Mr. Clarence Cherry, who for many years has done a myriad of tasks, backing up these busy offices. Half of a "Mr. and Mrs. Team", Mrs. Cherry comes to the Garden each week to work in the Garden Gate Shop.

CLIMATRON

The Climatron is an imposingly beautiful place; it is also a demanding one. Its volunteers, those who contribute of their time once a week or more, must be special people, for they expertly and pleasantly do many things – greet out-of-town visitors, answer questions of an infinite variety, calm and instruct hundreds of school children daily, meet emergencies, feed animals and birds, sell booklets and, of course, work with plants.

Volunteers, specifically, are used in the Climatron to act as hostesses: they can set the tone in the building — encourage children, especially, to view their visit as a walk through a place full of sound, beauty and new experiences; they can release the employees for duties in the adjoining greenhouses and for instruction of Project Stay and horticultural students; they can give employees, by their very presence, that extra time and sense of peace necessary for creative planning. Volunteers, too, work with plants: they can replant areas, feed plants, cultivate soil, prune shrubs. They keep our house in good order and they get their reward from an appreciative public.

Climatron volunteers range in age from a grandmother, whose white hair seems to work magic with restless young visitors, to a seventeen year old student whose work-study becomes a community service in this school without walls.

We welcome you as volunteers.

TOWER GROVE HOUSE

Volunteers in the country home of Henry Shaw, Tower Grove House, give visitors a glimpse of the Victorian times during which the Garden was founded. These ladies tell the story of Henry Shaw and the beginnings of the Garden, as they tour the elegant old house.

The Historical Committee of the Garden honored these women at a tea on May 18. Preceding the tea, a program, "A Musical Exploration into the Life and Times of Henry Shaw" was presented by Mrs. Dory Potts, soprano, accompanied by John Gross on the piano. Mrs. Warren W. Kirkbride, Chairman of the Committee, presented pins to each of the twenty seven volunteers who had completed their first year of service.

Seventy women staff Tower Grove House on a regular basis, providing tours each day of the week and on week-ends. Without them, it would be impossible to keep the House open for the enjoyment of the tens of thousands of people who visit the House each year.

THE HERBARIUM

Imagine what a job it is to organize the more than 2½ million plant specimens in the Garden's Herbarium. Volunteers make the job easier. They mount specimens, organize folders, and stamp them with accession stamps.

Sincerest thanks to Mr. Julius Boehmer, Jr., a graduate engineer who has been working in the Herbarium since his retirement several years ago. He is presently doing a job which wouldn't be done without his help, changing the folders in which specimens are stored to a color-coded system, which will result in much faster filing. The many hours he has spent at the Garden are deeply appreciated.

ANSWER MEN

Answer Men are volunteers — members of the Men's Garden Club of Greater St. Louis. These loyal men — avid, experienced, knowledgeable gardeners — provide the Garden's answering service of horticultural advice, and are on duty from nine a.m. until noon on weekdays. During the past year Fred Galen, Son Fesler, Jack Harner, W. C. Berkemeyer, C. E. Rhoads, J. A. Gewinner, and "Anchor Answer Man" Dan O'Gorman, who organized the service, have helped thousands of St. Louisans who have called the Garden for assistance with gardening problems.

The MISSOURI BOTANICAL GARDEN BULLETIN is published 10 issues per year monthly except January and August, by the Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Mo. 63110. Second class postage paid at St. Louis, Mo.

Lorine H. Compton, Editor

SUBSCRIPTION RATES:
$5.00 per year. $6.00 foreign.

GARDEN GUIDES

Since last September, fifteen thousand visitors toured the Garden in groups no larger than twenty-five people, with one of forty-three Garden Guides.

On these tours, children learned how the plants of the rain forest influence life in the tropics, or how the arid environment of the desert affects plant life; visitors from out of town heard the story of Henry Shaw and the history of the Garden; Garden Clubs saw the growing ranges and propagation areas; and high school and college students were awed by the millions of plant specimens stored in bright orange compactors in the herbarium. Each of these individuals left with a deeper appreciation of the Missouri Botanical Garden.

After an intensive eight-week training program, each Guide is committed to giving a minimum of two tours each week and a once-a-month "enrichment" meeting. A great group of ladies, their backgrounds range from botany and zoology and liberal arts, to physical therapy. One, a registered nurse on night duty, devotes one day a week to the Garden. Their hobbies include yoga, painting and pottery and needlepoint, some are devoted to city living and some drive hundreds of miles each year from the far suburbs to participate in the program.

To each of them, heartiest thanks from each department — for it is the Guides who provide the personal link between the scientific staff, the horticultural staff, and the administrative staff, to the people of the community whom we serve.

LIBRARY

At the heart of many of the library's activities can be found a dedicated group of volunteers, performing many tasks that would otherwise remain undone. In the library's bindery, four volunteer workers presently supplement the paid staff, Mr. Don Niederlander, Mrs. Mary Wahl, Miss Susan Schuchat, and Mrs. Jean Reed. Working in the bindery not only provides a valuable service to the Garden, but is very much an educational activity for the volunteers involved.

Elsewhere in the library, volunteers are also providing valuable assistance. Mr. Julius Gewinner is presently in the process of translating the correspondence of Ferdinand Jacob Lindheimer, a German immigrant who, in the mid-nineteenth century, collected plant specimens in Texas and the Southwest for Dr. George Engelmann and Dr. Asa Gray. Miss Rose Henke has, in the past year, assisted in transferring reprints from the library to the Herbarium, performed some major surgery on our card catalog in an attempt to increase its usefulness, arranged a substantial portion of the library's collection of botanical illustrations, and organized the library's collection of biographical and pictorial information on famous botanists. Mr. Llewellyn Kohn has performed frequent service for the library by assisting in our move to the John S. Lehmann Building and by acting as Stacks Supervisor to keep our books and periodicals in proper order.

HORTICULTURE

The volunteer is often a high school student coming in for regular periods during vacation or as part of a school program to gain experience on the job and then to go on to college to study Biology or Horticulture.

The homemaker with some spare time is another volunteer who gets down on hands and knees to weed when needed, prune to shape the plant, and improve the growth, and is on duty rain and shine the year 'round. These gals really get things done.

Not to be outdone, the men serve in many ways; pruning, weeding, digging, etc. "Sandy," one of our very loyal volunteers, since retiring about a year and a half ago, has been working full time during the week, and often comes in on weekends to help out — just because there is work to do.

THE TRUSTEES

In his Will, which was admitted to Probate in St. Louis, Missouri, on September 2, 1889, Henry Shaw left the Garden to a Board of Trustees, who serve voluntarily. One of their most important responsibilities is the selection of the Director, for it is the Director who is charged with carrying out the goals of the Garden, which were clearly outlined in that document.

The trustees are a group of unusually able individuals — business executives, bankers, industrialists, scientists, educators. They are dedicated to the Garden and its programs, and devote many hours to their duties as trustees. □

We salute all these people who serve the Garden so loyally, and wish to express our deepest appreciation.

FLOWER SUNDAY

CHRIST CHURCH CATHEDRAL

"I hereby devise and bequeath two hundred dollars annually to the Bishop of the Episcopal Church of this diocese, in consideration . . . that an annual sermon be preached in such church, and by such minister as he may select; on the wisdom and goodness of God as shown in the growth of flowers, fruits and other products of the vegetable Kingdom."

Henry Shaw did not participate actively in any church during his lifetime in St. Louis, but his Will includes the clause shown above, which established "Flower Sunday" at Christ Church Cathedral. Mr. Shaw also requested that the cathedral be decorated with flowers from the Garden on that day.

There are some interesting parallels between Christ Church, Henry Shaw, and the Missouri Botanical Garden. Christ Church, the first Episcopal Church west of the Mississippi, was founded in 1819, the year in which Henry Shaw arrived in St. Louis. During the ensuing forty years, Christ Church parish moved from borrowed quarters to a small structure at Third and Chestnut, to a larger building at Fifth and Chestnut. The parish experienced appreciable growth, and had become a vital force in St. Louis. A new church seemed necessary, and land was purchased at Thirteenth and Locust, the present location of the Cathedral, in 1859.

During this same period, Henry Shaw had amassed a fortune in business and real estate, had purchased the land which is presently the Garden and built Tower Grove House. He established the Missouri Botanical Garden in 1859.

Christ Church was consecrated cathedral of the diocese May, 1890. The first "Flower Sunday" took place in that same year, and it has been an annual event since then except in the early 1950's, when Eleanor Roosevelt was to speak, but illness forced her to cancel the engagement.

Many prominent men and women have delivered the annual sermon, including The Rt. Rev. William Scarlett, The Rt. Rev. Arthur Lichtenberger, and the Rt. Rev. John Elbridge Hines; Dr. Reinhold Niebuhr in 1938, and Dr. Maude Royden, for many years minister at Guild House in London, in 1942. Dr. George Moore, Director of the Garden spoke in 1933, and Dr. Arthur Holly Compton, in 1938. Dr. Compton later became Chancellor of Washington University and a trustee of the Garden.

In 1969, the historic cathedral was renovated, with imaginative concepts by Verner Burks and Kurt Landberg, architects. The purpose of the renovation was to modify the building for multiple use by increasing its flexibility, and yet not detract from its inherent beauty. The chancel platform can be varied in size and height, and lighting can be centered on various parts of the church. This renovation makes possible a floral display of much greater dimension. This year, it remained in place through mid-week: St. Louisans who work downtown and many visitors to the city had the opportunity to see the flowers.

The following "Flower Sunday" sermon for 1973, was preached by The Rev. Robert Place Patterson, Rector of the Episcopal Church of the Redeemer, Baltimore, Maryland, on April 29.

THE CREATION MYTH RE-VISITED: DOMINION MEANS RESPONSIBILITY

Widely reported in the papers a few months ago was an address by Dr. Robert Jastrow, a leading physicist with the space program. Dr. Jastrow remarked to the American Association for the Advancement of Science that if life, even fossil remains, is discovered on Mars, this would be a damaging blow to those who believe that life on earth stems from the action of God. He said such a discovery would bolster the scientific view that life is a natural product of chemical processes that can be explained without theology.

I fear Dr. Jastrow revealed more ignorance about contemporary theology than he would like to think, for his position — if reported accurately — would assume the Genesis account of Creation to be a naive pre-scientific explanation of the origins of life which has long since been disproved by science. Projecting this view to larger dimensions, the Bible, as a whole, can be regarded as a priceless collection of fairy tales which everybody should know about but nobody need believe.

It ruffles my feathers to hear otherwise intelligent people make authoritative statements about matters they know little about, and this seems to be especially true regarding religion, the Bible and updated theology. Herman Wouk's assessment hits the mark: "Some people seem to think all the equipment you need to discuss religion is a mouth."

Now, having vented enough of my anger, let me take a more positive tack and affirm the value and truth of the Genesis account of Creation. Actually there are two such accounts — the one which gets us into the Garden of Eden, which is more primitive than the highly stylized, later version, part of which we read this morning. The writer was not trying to tell *how* the world began, but what it means to have life, how it all inter-relates, and man's function in the whole process. He used a myth to tell his story, and a myth is an imaginary tale which points to what is valid and real. It is not factually true, but it leads us to true understanding. There are myths about George Washington and Abraham Lincoln. There are myths about St. Louis and about our family ancestors. They're not all true in fact, but they reveal something that is true about the character or heritage of people.

So the Genesis story is true in revealing the meaning of Creation, not the formula of Creation. And that is what theology is principally concerned with — the meaning of God's actions and our response to them. If we can get that straight, we can cease playing idiotic games of science vs. religion, because that's like trying to play tennis with a balloon.

One way of interpreting the Creation story is to regard the days of Creation as steps in the evolutionary process, steps which still are essential to the ongoing life process cycle. In this cycle, there is an interdependency of inorganic and organic elements which is called today an ecosystem. In simplified terms, there are four links or steps in this chain of life: inorganic matter and energy used by plants, such as sunlight, carbon dioxide and water; then plants which convert these into carbohydrates they and other organisms need to sustain life; then animals which feed on plants and man who feeds on the animals; finally, bacteria and insects which decompose plants and animals, returning their chemical compounds to the life cycle to be used again.

Now comes a startling comparison. The Genesis story begins with the creation of light, moves to plants, animals and man — showing even then the vision of an interconnection of all creation, how masterfully and purposefully everything fits together in the created order. The steps of creation parallel the ecological understandings of today, and this parallel goes one step further. We know that our ecological crisis is our own doing, and its solutions are our own responsibility. Any significant disruption of the chemical life cycle endangers life on earth, and only man can cause those disruptions, and only man can resolve them. Humans are responsible for maintaining the stability of our natural environment.

Genesis sees it the same way, "Then God said, 'Let us make man in our image, after our likeness: and let them have dominion over the fish of the sea, and over the birds of the air, and over the cattle, and over all the earth, and over every creeping thing that creeps on the earth.' " To have dominion is not to have a blank check for exploiting, but a mandate to maintain the earth, our ecosystem, as it was intended to be maintained. Our responsibility is to fulfill God's purpose in creation, and when we violate that responsibility the system is disrupted and life is threatened. And only as we resume our responsibility can we restore a stable balance in our ecosystem and truly exercise reasonable dominion. The links between the ecological issues of the day and the meanings of the Creation myth are dramatically evident.

I'd like now to take a broad spectrum look at our ecological issues in light of the mandate to have dominion over creation. There are three root causes behind the variety of issues we now face: technology without adequate values, rampant consumerism and overpopulation. I'm going to emphasize the first over the other two, but all three are crucial concerns.

Technology without adequate values means something like this: if it's possible to make it, it must be necessary to have it. We seldom stop to ask, do we really need it; how will it affect the total life system? As a result the very forces, expertise and knowledge which can improve life can also destroy it. Let me illustrate this by telling a fable from ancient India.

"Four royal sons were questioning what specialty they should master. They said to one another, 'Let us search the earth and learn a special science.' So they decided, and after they had agreed on a place where they would meet again, the four brothers started off, each in a different direction. Time went by, and the brothers met again at the appointed meeting place, and they asked one another what they had learned.

" 'I have mastered a science,' said the first, 'which makes it possible for me, if I have nothing but a piece of bone of some creature to create straightaway the flesh that goes with it.'

" 'I,' said the second, 'know how to grow that creature's skin and hair if there is flesh on the bones.'

"The third said, 'I am able to create its limbs if I have the flesh, the skin, and the hair.'

" 'And I,' concluded the fourth, 'know how to give life to that creature if its form is complete with limbs.'

' Thereupon the four brothers went into the jungle to find a piece of bone so that they could demonstrate their specialties. As fate would have it, the bone they found was a lion's, but they did not know and picked up the bone. One added flesh to the bone, the second grew hide and hair, the third completed it with matching limbs, and the fourth gave the lion life.

"Shaking its heavy mane, the ferocious beast arose with its menacing mouth, sharp teeth, and merciless claws and jumped on his creators. He killed them all and vanished contentedly into the jungle."

Leaping over the ages, this myth illuminates the truth that unless technology is balanced with a value system or an ecological ethic, it will become an instrument of the destruction, not the improvement, of our environment — and ultimately ourselves.

Near my home in Baltimore, massive excavation is making way for one of those highway loops connecting the beltway with one of the main arteries into the city. It is a necessary undertaking which promises to increase the safety factor over the present arrangement. But the excavating has caused silt to pass into a lovely lake surrounded by a park and natural beauty. The lake is fast filling up with this silt, and it is no exaggeration to say it is being destroyed very quickly.

A citizens' group has galvanized into action, and several contractors have offered to dredge and restore the lake at a price far below cost. Still needed, however, is $200,000, and, while the city and state bicker over who will pay this relatively small sum, the lake is rapidly dying. Useful, even essential, technology, without consideration of the effect on the world which sustains life, is progress backwards. In every area of technological advance we need an equal concern and plan for dealing with the ecological consequences lest we fail to exercise responsible dominion over God's creation.

The two areas of consumerism and overpopulation are perhaps more directly influenced by individual action. We have fulfilled the injunction to "be fruitful and multiply" and we are now keenly conscious of the need to control population. But consumerism still has us in its grasp. We spend and buy not on the basis of what we need but of what we want. We have been bilked into believing that we must buy and be in debt to keep America strong. The surging gross national product, once seen as a sign of progress, may in fact be an epitaph of demise. We have so much throwaway junk that the average American produces more than a ton of solid waste a year, and the only answer seems to be a trash compactor in every kitchen.

No one but people can turn the tide of this insidious wave of waste. Sacrifice is involved in doing this, and giving up things runs counter to the pervading spirit of acquiring more things. Yet we have the Biblical mandate and the ecological demand to develop an ethic of living which sees beyond the immediate horizon of uncontrolled consumption to the longer view of responsible conservation of limited resources. I believe that the Old Testament dimension of dominion over creation and the New Testament call for creative stewardship provide an essential framework of an ethic to which we must be recalled.

T. S. Eliot once remarked that "a wrong attitude toward nature implies, somewhere, a wrong attitude toward God, and the consequence is an inevitable doom." Our use of our natural resources and our technological inventions are direct indicators of the quality of our relationship with God. It is conceivable to me — and a hopeful sign — that the emerging evangelical thrust of the '70s will eschew the individualistic piety of another era, and motivate people to consider how their social behavior reflects what they think about God. And if we can restore a measure of consciousness-raising about our relationship with God and at the same time turn from apathy and protective defensiveness to action regarding our environmental problems — then we will in the process have recovered dominion over all God's earth and we will preserve the creation we have been called to govern and enjoy.

The focus of the Christian Faith and the impact of the ecological crisis are inseparably bound together, and the meaning of the Creation myth today makes this inescapably plain. The writer of Deuteronomy strikes a resounding chord, and I suggest you and I reflect and then act in response to it. "I call heaven and earth to witness this day, that I have set before you life and death, the blessing and curse. Therefore, choose life."

That choice is an opportunity and a mandate. Not to choose life is to be swept up in the forces which cause the death of our environment. The greater sin is to believe we can do nothing and decide to do just that. That would be a blasphemous abdication of privilege and responsibility. Individuals, singly and collectively, have done and still can do much to reverse the surging tide of ecological suicide. We have but one life and one world, and the God of Creation calls us to be engaged in pursuing the lines of evolutionary hope toward fulfillment. I know of no greater opportunity set before us in this season of new life rising from death than to respond to that call of God to us his people, to be agents of the power of Resurrection in life here and now, and to do this while we have time. □

MOSSES FROM MADAGASCAR

Marshall Crosby

Marshall Crosby is Curator of Cryptogams in the Garden's herbarium. Cryptogams are lower plants — fungi, algae, lichens, liverworts, ferns, and *mosses. The word means hidden -sex, and was given to this diverse group of plants long ago before botanists learned how they reproduced.*

Dr. Crosby attended Duke University from 1961-1968, where he received his B.S. and Ph.D. degrees. He specialized in the study of mosses, especially tropical mosses. He recently spent four months on a collecting trip which included the island of Madagascar.

Though it may seem difficult to explain the necessity of studying these small, economically and socially unimportant plants, the past few years have shown them to be useful indicators of mineral rich soils and as inexpensive indicators of air-pollution levels.

The fourth largest island of the world, Madagascar is located southeast of Africa. The Mozambique Channel, which separates the island from the African continent, is only about 200 miles wide, yet one must look not to Africa, but to the Malayo-Polynesian regions to explain the physical aspect, language, and traditions of the Malagasy people.

As early as 100 A.D., Malayo-Polynesians are believed to have migrated to Madagascar in outrigger canoes. The vast distance was probably covered with the help of favorable southwest monsoon winds. Today, one can still see canoes of this type in coastal areas. Ubiquitous rice paddies are another indication of the Indo-Asian heritage.

Later immigrants to Madagascar included Arabs, who were the first to write down Malagasy — the Malayo-Polynesian language of the people of Madagascar. Africans came to the island primarily as slaves. A vital part of the economy of the ruling Imerina tribe, slavery was eventually abolished through the efforts of European missionaries of the nineteenth century, who also wrote the language in Roman characters. The French took possession of Madagascar in 1896 and governed until 1958, when the island became the independent Malagasy Republic. Today the French influence is strongest in the cities, where the French language is widely understood.

My wife and I visited Madagascar as part of a 4 month trip to collect mosses in several islands of the Indian Ocean, Tanzania, Kenya, and South Africa. The trip was made possible by the Sunnen Foundation, St. Louis, and the National Science Foundation.

We arrived in Tananarive, the capital of Madagascar in mid-October, 1972. We hoped to take advantage of the dry season to collect mosses throughout the island.

The mosses of Madagascar are known primarily through collections made by botanists specializing in plants other than mosses or by amateurs. Although this kind of collecting has provided valuable information about the diversity and distinctiveness of the mosses of Madagascar, a person specializing in the study of mosses is able to provide a more complete collection of the mosses simply because he notices mosses often overlooked by the general collector.

I was particularly interested in searching for mosses of the genus *Squamidium.* About 30 species of the genus occur in the American tropics, but a few have been reported from Madagascar and nearby East and South Africa. Having collected many of the American species, I was anxious to see and study the Old World ones in the field. At the same time my wife and I would collect as many other mosses as possible in order to add to our knowledge of the little-collected areas we would be visiting.

Our first week in Madagascar was spent planning collecting trips and obtaining official permission to visit national forest reserves.

The choice of collecting sites was based on the following factors which usually indicate a good "mossing" area: 1) High rainfall – the island is divided by a central series of high plateaux. The land east of the plateaux slopes steeply to the Indian Ocean, while to the west there is a more gradual slope to the Mozambique Channel. Direct exposure of the east coast to the trade winds earns it abundant rainfall – more than ten feet a year at the coastal port of Tamatave – as well as numerous cyclones. The west coast is generally drier and hotter than the other areas of the island. 2) High altitudes – the central plateaux are divided by various mountains, Andringitra (8,000 feet) 200 miles south of Tananarive; Ankaratra (7,800 feet), only 40 miles south of the capital; and farther north, the massif of Tsaratanana (9,500 feet), the highest mountain of the island. 3) Undisturbed forest – only a small amount of primary forest still exists in Madagascar today.

Much of the land of the high plateaux is under cultivation, primarily rice, and forest areas are being rapidly burned. Reforestation is normally in pines and eucalyptus trees, under and on which mosses rarely grow. Fortunately some forest is protected in forest reserves and stations. Forest covers a fair amount of the eastern slope, probably because much of this area is inaccessible or not suitable for cultivation. 4) Accessibility – the system of roads in Madagascar is very poorly developed. Other than the road from Tananarive to Fianarantsoa, 200 miles to the south, and from Tananarive northwest to the port of Majunga, few roads are paved, and many are impassible during the rainy season. Fortunately, the internal air service is well developed.

As a result of these considerations, we decided to concentrate our collecting in the following areas: the vicinity of Tananarive, the route from Tananarive to the east coast port of Tamatave, the area of Andringitra, the northwest island of Nossi-Bé, and a forest reserve near the northern port of Diego-Suarez.

We rented a car and took several day trips from Tananarive, including a trip to Ankaratra. We were at once disconcerted by the lack of sign posts. For although some half-erased kilometer markers remained from the French rule, they only indicated the distance to the end of the road. To make a turn off the main road, we would contemplate the possible dirt roads and choose the widest one which seemed to go in the right direction. Fortunately, the paucity of roads helped to reduce the number of choices.

Our first long trip was down the eastern slope to the coastal port of Tamatave. We hoped to collect in forested areas along the 230 mile route. Although the road leads from the capital to the most important port of the island, it is paved less than halfway. Though mercifully dry, the winding dirt road was tortuous, pocked with potholes which often threatened to engulf our small Renault 4 car. We drove the 125 miles of unpaved road in 7½ hours, and marveled at the large port that existed at the end of such an impossible road. We were rewarded with an interesting collection of coastal mosses, however. The sight and smell of clove trees in bloom and the blue of the Indian Ocean delighted us.

We were even more richly rewarded on our second trip, to the massif of Andringitra. We were accompanied by two Malagasy forest rangers, to a small village at the base of the mountains. The foresters kindly provided us with meals and a place to sleep during our stay. After a day collecting, we were invited into a villager's two story red brick home for a late lunch of rice, chicken, and tea. Then, after settling into our room at the forest station and

sorting through our day's collections, we were again served rice, chicken and tea in the flickering of candlelight. We laughed when the foresters told us that a Malagasy ate rice, chicken, and tea three times a day. But we were not as amused the next morning when a heaping bowl of rice and chicken was placed before us for breakfast.

We collected a large number of mosses in the high altitude forests and thoroughly enjoyed living in the village. The villagers were shy but curious, and on the last day, as I sorted out mosses and gave them Latin names for the foresters, I realized that the small room had suddenly filled with children, some holding others, peering to get a look at us.

Later on that same trip, we made a collection which is an interesting addition to the knowledge of Malagasy mosses. As I was climbing on a hot, rocky, insect-infested hillside, covered with thorny shrubs and vines, I suddenly saw a large golden-colored moss which I recognized immediately from earlier collecting trips in tropical America. I scrambled through the bush for another hour looking for more plants of it, but I found only a few stems on scattered trees. Comparison of the plants I found in Madagascar with others in the Garden's herbarium confirms that this is the same species, *Adelothecium bogotense,* which occurs in the West Indies and Central and South America. The determination of the significance of this collection awaits study of the remaining collections from Madagascar to see if there are other mosses which "disjunct" from the New World across the Atlantic Ocean and continental Africa to Madagascar.

After our trip to Andringitra, we flew to the northern end of Madagascar to collect on the offshore island of Nossi-Bé and in the d'Ambre Forest Reserve, south of the port of Diego-Suarez. Preliminary studies of the literature concerning Malagasy mosses led us to believe that Nossi-Bé would be a good place to visit. However, the island turned out to be not very "mossy" at all.

Collecting in the d'Ambre Reserve was much more successful — in spite of heavy downpours (the dry season was ending by this time) and leeches which clung to our arms, legs and necks by the hundreds. At d'Ambre we collected two more genera, *Eriopus* and *Distichophyllum,* which had not been discovered on Madagascar before. While these genera are known from Africa and islands only a few hundred miles to the east of Madagascar, our discovery of them points out how important it is for specialists to visit little-known tropical areas to collect the organisms in which they are interested.

The highlight of our stay in East Africa was a week spent in the Uluguru Mountains near Morogoro, Tanzania. While most East African mountains are rather young and volcanic in origin, the Ulugurus are old, crystalline mountains. Furthermore, the mosses which occur in these mountains differ considerably from those in the volcanic mountains, *and* many of them are known otherwise only from Madagascar. These facts were pointed out to us by Dr. Thomas Pócs, a Hungarian botanist who has been working in East Africa for four years, and with whom we stayed while collecting in the Ulugurus. Pócs was able to demonstrate the similarity of Uluguru and Malagasy mosses by showing us plants of *Rutenbergia* — a moss genus which was only known from Madagascar before he began his work. Since Pócs has concentrated on liverworts and I have concentrated on mosses, we hope to collaborate in a study of these two groups as they occur in Madagascar and the Ulugurus.

After leaving the Morogoro area, we proceeded north and collected near Mount Kilimanjaro in Tanzania and on the slopes of Mt. Kenya in Kenya. Our stay in East Africa ended in Nairobi with the usual packing and shipping of specimens — this time using zebra-striped "Kenya Cane" — a type of East African rum — boxes as shipping cartons.

During our four month-long trip we shipped back 50 boxes stuffed full of mosses. All of these have now arrived in St. Louis though some of those which we shipped from Madagascar in mid-November have only recently arrived here — water-stained and smashed, but the mosses are safe. The job now is to process the thousands of mosses collected. This includes soaking each collection and separating from it leaves and twigs, pressing and re-drying it, and preparing a label giving collection information. Finally each collection must be identified and then packeted and placed in the herbarium. Duplicates of our collections — we made over 4000 separate collections, and these should result in 15,000 to 20,000 duplicates — will be exchanged with other herbaria in order to enrich the Garden's collection of mosses. □

Gardening in St. Louis

GARDENING IN JUNE

In many areas this spring, gardens suffered due to severe frosts when growth was well advanced. This frost, in many areas, caused partial freeze back, delaying flowers on roses and, in some cases, even freezing flower buds and leaves. Heavy rains and excess water left soils very wet and held up planting.

Due to cool, moist weather, grass has flourished and lawns well fertilized are extra lush at time of writing. It is still not too late to control and eradicate weeds. Cut to a height of 2-1/2 inches — no closer — to insure good growth through the summer.

Roses will benefit, as will many other plants, from a feeding of liquid fertilizer to encourage better growth and flowering. In watering, make sure plants receive the equivalent to 2 inches of rain. Roses keep best if cut in late afternoon and then plunged at once into warm water. Place container in cool spot for a couple of hours before arranging.

Portulaca is a good, old-fashioned, low growing flower for quick results in a hot, exposed situation. Sow seed now.

Softwood cuttings are readily made this month, such as boxwood, privet, euonymus, weigela, yews and others. Cuttings 6-10 inches long are ideal. Place in a mixture of perlite and peat in plastic covered trays. Keep in cool, shaded areas and see that they are moist at all times. Rooting hormone is helpful to speed rooting.

Continue to set out annuals where color is needed. Shade from hot sun for the first few days.

Perennials may be started now from seed in the cold frame for setting out into the garden in early September.

Window boxes and container grown plants need to be kept moist at all times and fed regularly with liquid fertilizer for best results.

Continue to prune spring flowering shrubs that have not been done, remembering that the flower buds for next spring are produced in the current season's growth. Plants in this category are spireas, viburnums, deutzias and weigelas. Prune Japanese quince lighter than the others.

Second sowing of many vegetables can be made late this month for a late crop such as beans, beets, carrots, corn and turnips.

Most evergreens can be pruned this month. Prune to retain the natural look where possible. If it is necessary to cut back the leaders of evergreen trees to control height and encourage the plant to be more bushy, this work should be done at this season, when the wood is soft, green and watery. It should never be attempted when the wood is stiff and hard. At least an inch should be left for the setting of a new bud.

Watch for spider mites in roses and evergreens. Spray with Kelthane, according to directions. Use Benlate to control mildew.

Keep your garden notebook up to date so as to avoid late mistakes and to record changes needed later in the garden that cannot be made until fall or next spring.

The new annual introductions for 1973 and 1974 are now on display at the Garden, and are worth periodic visits to observe their development. ☐

BAMBOO

The bamboos are woody stemmed, usually evergreen, perennial grasses. Bamboo is found growing in many countries, including three species that are native to the United States.

Many types will grow in the north and are perfectly hardy below 0°F. Bamboo has been used for food, clothing, weapons and all sorts of containers. It is used for building houses, bridges, pipe for carrying water and many other uses. Some varieties are grown indoors for decorative purposes.

Approximately 30 varieties and species are being planted at the Garden this spring and next fall for evaluation in regards to hardiness and growth. Plants are being set out in the area known as the Organic Garden and are labelled to enable people to see the difference in each type as it grows.

Bamboo is of easy culture and grows in soil of low fertility and poor drainage, but does best in soil that is well drained. It thrives when well watered; in fact, leaves will curl if water is lacking. Most will thrive in full sun, although they do well in partial shade.

Bamboos are propagated in the spring by dividing the clumps with a sharp spade and cutting the tops back to within 2 to 3 feet of the top of the ground.

Bamboos do well in containers and can be grown in planters, tubs and pots. Use good soil, well enriched with organic matter and feed at regular intervals with fertilizer high in nitrogen.

Insects are rarely a problem; most common are aphids, which are easily controlled, or red spider when plants are grown indoors. Spiders are controlled by spraying with Malathion. ☐

BAL ORIENTALE

Sponsored by Stix, Baer and Fuller
for the benefit of the Missouri Botanical Garden
the evening of September 21

Bal Chairman Mrs. Sanford McDonnell (right) and Committee Members Mrs. Maurice Chambers and Mrs. Edwin S. Jones select a site for the outdoor party.

The first benefit for the Garden to be held on the grounds of the Garden promises to be a gorgeous party. Cocktails, dinner, dancing, and entertainment in the most beautiful setting in the city.

Be a Patron of the Bal, and help make the benefit a success. Patrons contribute $100 per couple, ($50 for an individual), have their names listed on the invitation, receive two tickets to the Bal, and preferred seating. $80 is tax deductible.

Please make checks payable to the Missouri Botanical Garden, and mail to the Garden, Bal Orientale, 2315 Tower Grove, 63110. Please indicate how you wish your name to appear on the published list of patrons.

NEWS AND NOTES

The Missouri Botanical Garden is represented in the Gorham "Best Dressed Tables" competition, an annual benefit. The Grand National Award is a $1000 contribution to the organization.

Mrs. Bourne Bean and Mrs. Mahlon Wallace, III, have designed a table setting which will be on display at Jaccard's Clayton store, during the week of June 18. Be sure to stop by and see the lovely arrangement. Winners are chosen by popular balloting, and jury decision.

Summer Sundays are Special at the Garden. During July and August, several performing groups will appear on the Garden's outdoor stage on Sunday afternoons. There will be folk-rock groups, western groups, theater, chamber music, a full symphony, ragtime and dixieland, and even bagpipers.

Check the newspapers and the July *Bulletin* for dates of these coming events.

Missouri Botanical Garden
is a fund member of

The Arts and
Education Council of
Greater St. Louis

Pitzman Summer Nature Program. A new session of the Pitzman Summer Nature Program begins each Monday during June and July. The first week's study is held at the Garden, and the second week of each session is held at the Arboretum in Gray Summit, Mo. For more information, and to register, call the Education Department, 865-0440.

Make Membership a Gift. Think of a Membership in the Garden, as a gift for someone special. In addition to the many benefits which the recipient will receive, your added support of the Garden through a gift Membership, will help the Garden grow.

At the Arboretum, a gate fee is now in effect. Members are admitted free, but please stop at the Visitor's Center and register when visiting the Arboretum.

The staff requests that you please do not bring dogs to the Arboretum. Similar rulings are being made with increasing frequency in both federal and state areas. Free running dogs can be very destructive to a natural environment.

These new bronze letters on the stone wall on Shaw Avenue at Tower Grove, were made possible by a contribution from the Garden Club of America, after the 1971 annual meeting which was held in St. Louis. This sign, as well as a plan for signs to be placed throughout the Garden, was designed by Chip Reay, of Hellmuth, Obata, and Kassabaum.

THE MEMBERS — *our largest group of volunteers*

One of the great botanical institutions of the world, the Garden is the only institution of stature which receives no direct tax support. Entirely dependent upon private contributions, it grows and provides its services because a devoted Membership continues support through regular annual giving, and Life Membership gifts to the endowment.

The Garden gratefully thanks each one of its Members.

NEW LIFE MEMBERS

Mr. Lester M. Abbott
Mrs. Charles E. Bascom
Mrs. Ellis H. Hamel
Mr. & Mrs. Daniel L. Schlafly

NEW CONTRIBUTING MEMBERS

Mr. & Mrs. Robert A. Jacob

NEW INDIVIDUAL MEMBERS

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Mrs. Sylva Bendy
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Miss Jewel Stephensmeier

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Miss Nancy Baumgarten
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Dr. & Mrs. Gerald Wool
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MISSOURI BOTANICAL GARDEN BULLETIN
2315 Tower Grove Avenue
Saint Louis, Missouri 63110

**SECOND-CLASS
POSTAGE
PAID
AT ST. LOUIS, MO.**

MEMBERS DAY June 21

Open House *New* Members Lounge — 10 a.m. - 3 p.m.
Administration Building — Refreshments

"The Garden Through the Years"
Museum Building — 11 a.m., 1 p.m., 2 p.m.

Gift Plant — 1974 Introduction
A new Geranium

Present your Membership Card in the Growing Center. Plant may be picked up on Members Day, or Saturday, June 23, until noon, only.

Missouri Botanical Garden Bulletin

Illustration is from a woodcut of a lily *(Liliaceae* family) in the *Latin Herbarius* printed by Peter Schöffer in Mainz in 1484.

THE LIBRARY

An Outstanding Past — A Look To The Future

When Henry Shaw first began to plan for the creation of a botanical garden in St. Louis, he frequently sought advice from Sir William Jackson Hooker, the Director of the Royal Botanic Gardens at Kew, England, and one of the nineteenth century's most outstanding botanists. In one of his communications to Shaw, Hooker stressed the importance of a library to support the scientific and horticultural activities of a botanical garden.

Mr. Shaw took this advice to heart, and, in the late 1850's, commissioned Dr. George Engelmann to undertake a trip to Europe to purchase plant specimens for the herbarium and books for the library.

These books and plants were assembled in the Museum Building, and in 1859 the Garden's library and herbarium began to function. The role these two departments have played in the almost 115 years of their existence cannot be ignored by any student of American scientific history.

Since 1859, the Garden's library has grown to become one of the nation's most outstanding collections of botanical and horticultural information. Now housed in the John S. Lehmann Building, the library possesses five centuries of mankind's printed knowledge of plants.

The statistics of this library are almost overwhelming: 75,000 bound volumes of books and journals, between 90,000 and 100,000 unbound pamphlets and reprints, over 100,000 manuscript pieces, several hundred examples of botanical art and illustration, over 3,000 maps, several thousand photographs and a large collection of newspaper clippings, biographical data, and pamphlet materials relating to the Garden. Numbers alone, however impressive they may be, cannot tell the full story of this library.

Even the briefest glance at the library's collections show a diversity of printed materials on plants. The library attempts to collect every published item relating to the systematic study of higher plants, and has an estimated 85 — 90 per cent of the world's printed literature on this subject. Other topics collected include plant ecology, botanical history, gardening, plant anatomy, plant folklore, horticulture, flower arranging, plant geography, paleobotany (the study of fossil plants), economic botany, and medical botany.

The rare book collections, housed in two atmospherically controlled rooms, constitute an important part of the library. The Pre-Linnean collection, presently numbering nearly 1,000 items consists of botanical works published *before* the middle of the eighteenth century, including many of the early printed herbals. The Linnean collection of over 1800 volumes, includes many publications by and about Carl von Linne, the founder of the modern science of systematic botany. These two collections are very important to the scientist, as it is frequently necessary for the researcher to study the earliest description of a plant that has been published.

The outstanding physical facilities of the John S. Lehmann Building provide us one of the most modern research libraries in the country. Designed by the architectural firm of Hellmuth, Obata and Kassabaum, the library's special features include climate controls to maintain the temperature and humidity at optimum levels, a central display area for special exhibits, and a well-equipped bindery to preserve the library's collections.

The Garden's staff of professional horticulturists and botanists are, by nature, book-oriented, and throughout the entire history of the Garden have provided invaluable assistance in developing our collections. Our holdings of materials on the systematic study of higher plants are among the most comprehensive in the nation, largely because of the advice and assistance provided not only by the library staff, but by the botanists, educators, and horticulturists who have been employed at this institution throughout the past 115 years.

Volume LXII Number 6

July, 1973

Special Collections

Manuscripts

The Garden's manuscripts and archives collection, which presently numbers over 100,000 items, is important as source material for the study of St. Louis and Missouri history, 19th century explorations in the American West, and the history of American science. Two of the most important collections in the library's archives are the correspondence, personal papers, business records, and related documents of Henry Shaw and Dr. George Engelmann. The Shaw papers are historically important, not only to trace the early years of the Garden, but also as a record of nineteenth century social, scientific and economic conditions.

In the early 1840's, Engelmann began an extensive correspondence with almost all of the outstanding European and American botanists and naturalists of his era. His papers are rich in correspondence from such important figures as John Charles Fremont, John Muir, Asa Gray, Josiah Gregg, Thomas Nuttal and countless others. In addition to this correspondence there are sixty volumes of his notes and drawings from his studies of yucca, cacti, conifers, etc., as well as his entire personal library.

The library also possesses an autograph collection of letters of botanists. The unifying theme of many of these letters was a celebration of the Garden's Board of Trustees 25th anniversary in October 1914, and much of this correspondence was necessitated when World War I broke out and many European botanists were unable to travel to the U.S.

Art

The library's collections are rich in examples of botanical and horticulutral art, ranging from an early illustrated herbal (Peter Schoffer's *Latin Herbarius,* 1484) and a fine reproduction of the oldest known manuscript herbal *(Herbal* of Dioscorides, 512 A.D.) to contemporary linocuts of plant subjects by Henry Evans.

One of the surprises created by the move to the John S. Lehmann Building was the rediscovery of approximately 300 original water-colors of plants and birds acquired by the Garden seventy years ago and totally unknown to anyone presently on the staff. These paintings were executed by Sarah F. Price, who in the 1880's and 1890's was an active plant collector in the Bowling Green, Kentucky area, whose specimens are now part of the Garden's herbarium.

Other Collections

Among the other treasurers housed in the library are portraits and biographical data for many botanists and horticulturists, a substantial map collection useful for determining the geographical distribution of plant species, a collection of early landscape plans and blueprints of buildings in the Garden and in its vicinity, a photograph collection, sets of microfiche photographs of plant specimens from major European herbaria, and a vertical file of pamphlets, clippings, and ephemeral materials relating to botany and horticulture.

Visitors from the U.S.S.R. in the rare book room of the Library.

Donations

Almost from its founding, the library collections have frequently been enhanced through the generosity of donors, both individual and institutional. Among the more substantial gifts have been the personal libraries of Dr. George Engelmann, Dr. William Trelease, and Dr. E. Lewis Sturtevant, whose library composes a substantial portion of our Pre-Linnean collection.

Donations are still an important source of materials. A partial list of recent donors includes:

Mrs. C. H. Conway, Aurora, Indiana
Miss Rose Henke, St. Louis
Mrs. Lois Westlake, St. Louis
Mrs. Anna Evers, St. Louis
The Frontenac Garden Club
Mr. David Spellman, St. Louis
Mrs. George D. Stout, St. Louis and
  Mrs. George H. Stout, Seattle
Mr. & Mrs. F.W. Floyd, Potosi, Missouri
Takeda Chemical Industries, Ltd., Osaka, Japan
Mrs. Nedra C. Carp, St. Louis
Mrs. William H. Rivers, St. Louis
Dr. Elbert L. Little, Jr., Washington, D.C.
Dr. George Eiten, Brasilia, Brazil
Mrs. Fothergill Graves, St. Louis

Book Preservation

One of the gravest problems facing America's libraries is the problem of preserving the materials in their possession. In the nineteenth and twentieth centuries, countless numbers of books and journals have been printed on paper with a high acid content. As each year passes, this paper becomes more discolored and brittle, and librarians increasingly often find themselves the curators of material that no one can be permitted to handle for fear that it may disintegrate completely.

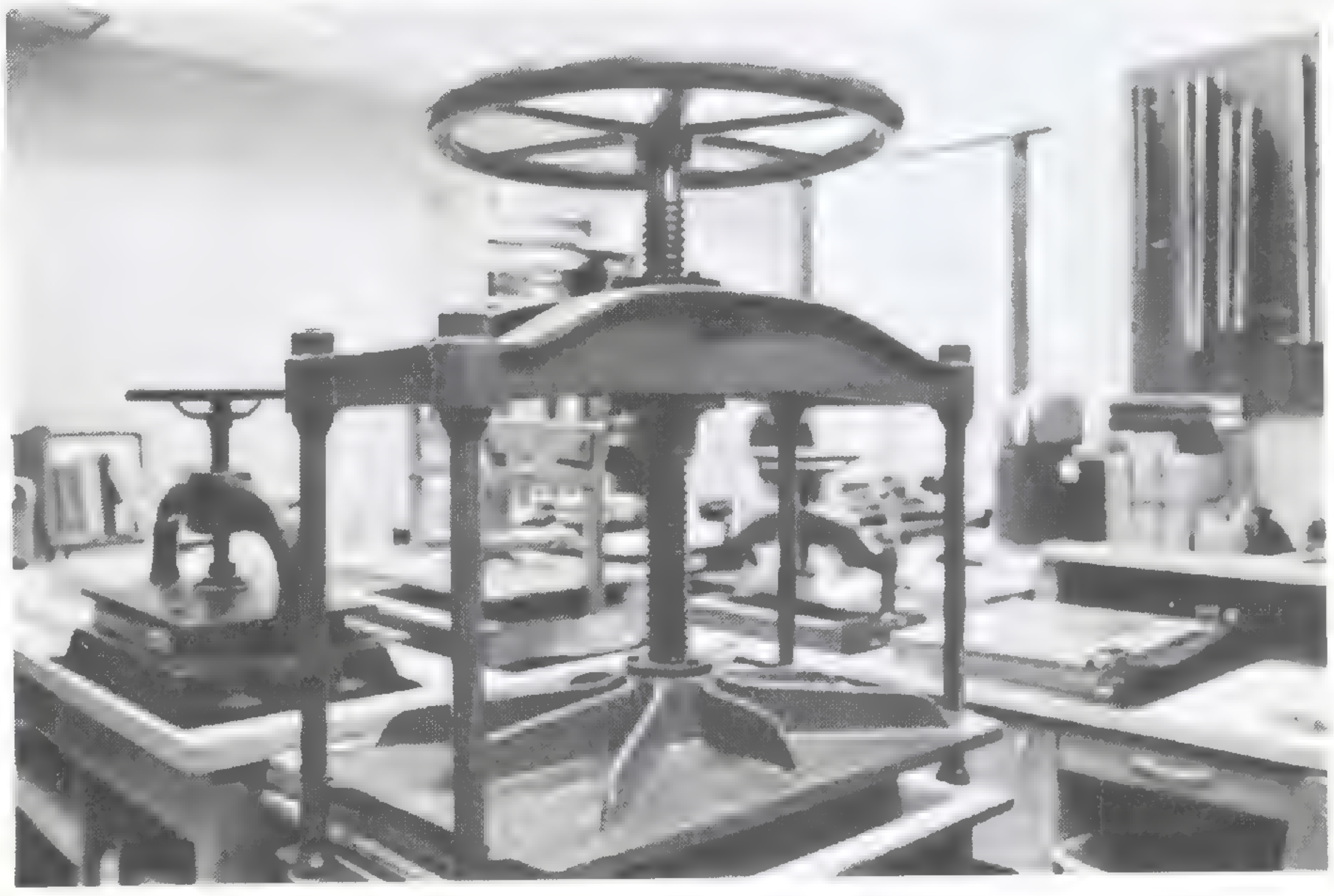
Books have many enemies — humidity, heat, light, molds and mildews, floods and fires, careless users, insects, rats, and air pollution — to name a few. In the past 115 years, books in the Garden's library have been subjected at various times to all of the above, with the possible exception of floods and fires. The completion of the John S. Lehmann building was particularly significant in that it provided, for the first time in our history, protection against these agents of destruction.

Corrective measures must be taken, however, to restore much of our collection to a satisfactory condition. Between 1/2 and 2/3 of the materials in the library need at least some attention from skilled binders and conservators to repair the damage of the past and to minimize future deterioration.

The art of book binding and book restoration takes years to master, and there are no more than a few dozen competent professional hand binders in this country. The library is fortunate to have on its staff one of these craftspeople, and we are equally fortunate to have a book restoration shop as part of our library's activities. Several volunteers and students have studied and worked in our bindery at various times, and there is now a waiting list for volunteers seeking to assist in our binding operations.

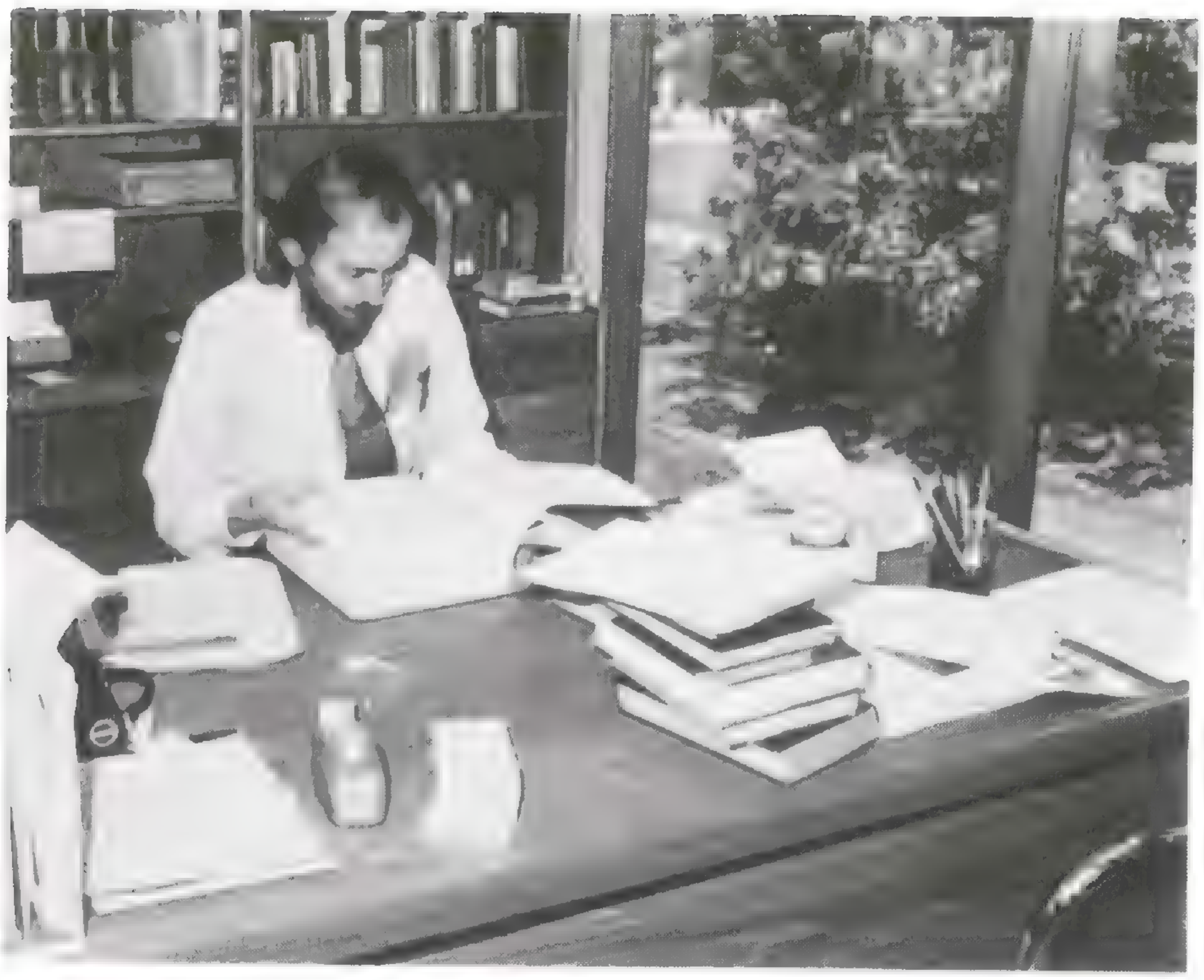
Recognizing the importance to artistic history of our large collection of illustrated folios, the National Endowment of the Arts has recently awarded the library a grant of $14,140 to help restore these items. This is a significant step in our efforts to preserve and maintain our holdings, but many other items in the library are equally in need of treatment.

The library's set of Curtis' *Botanical Magazine* (now in its 188th volume) is one treasure requiring immediate attention. One of only twenty-three complete sets in the United States, this magazine is of importance both for its descriptions of rare and little-known plants and for the outstanding beauty of its illustrations, all of which were hand-colored from 1787 until 1948, when economic considerations forced its publishers to resort to a high-speed color printing process. Curtis' *Botanical Magazine* is constantly used by students and scholars of botany and horticulture, and the set owned by the Garden suffers from torn and fragile bindings, loose plates, torn pages, and a variety of other binding problems. One of the nation's most outstanding book restorers has agreed to do the necessary work on this important set at a cost of $150 per volume. Anyone interested in donating toward this project is invited to contact the Director, Dr. Peter H. Raven, or the Head Librarian, Mr. James R. Reed. Recognition to donors will be provided through the provision of a suitable bookplate in each volume restored.



Reorganization

The growth of the library over the past 115 years has recently necessitated some changes in the physical arrangement of the collection. The books and journals are presently being reclassified to a system based upon that used in the Library of Congress in order to make our arrangement more compatible with that used by many of the nation's other major research libraries. It is anticipated that this project may take another 20 — 30 man years of effort to complete, at which time all the materials in our collection will be satisfactorily arranged by subject.



Head Librarian James R. Reed is a native of Durango, Colorado. He received his A.B. from Fort Lewis College, and an A.M.L.S. from the University of Michigan at Ann Arbor.

Assistant Librarian Mrs. Carla Lange was educated in Berlin and Florence. Mrs. Lange is proficient in every major European language, including Russian.

The MISSOURI BOTANICAL GARDEN BULLETIN is published 10 issues per year monthly except January and August, by the Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Mo. 63110. Second class postage paid at St. Louis, Mo.

Lorine H. Compton, Editor

SUBSCRIPTION RATES:
$5.00 per year. $6.00 foreign.

Because this massive accumulation of literature on the plant sciences is housed in the same building with the world's most modern herbarium, the Missouri Botanical Garden is an important scientific resource for the entire nation, if not the world. Within the past twelve months, approximately 1500 researchers and students have made personal visits from throughout the United States and from at least 25 foreign nations and 4 continents in order to use our facilities.

The library is also an important adjunct to the undergraduate and graduate teaching programs of many colleges and universities in the St. Louis area.

The library's service is not restricted only to scientific researchers. Efforts are presently under way to increase our usefulness to members of the Garden and to interested citizens in the Illinois-Missouri area. The past several months have seen a variety of plans develop – activities ranging from an exhibit of botanical art to attempts to expand cooperative agreements with other libraries.

With financial assistance from the Missouri State Council on the Arts, the library has recently prepared a travelling exhibit of 500 years of botanical art and illustrations, showing a variety of subjects, styles, and artistic methods. Included are sections of an illuminated manuscript, pages from early printed herbals, noteworthy examples of botanical book illustration, and a few examples of contemporary original art works with floral themes. Groups (particularly garden clubs) interested in sponsoring this display in their community are invited to contact the Missouri State Council on the Arts, Suite 410, 111 South Bemiston, St. Louis, Mo. 63105.

By mid-summer, the library will have established a separate Environmental and Horticultural Reference Center, containing current and classic books on many gardening and environmental topics. All interested people will be welcome to make use of this Reference Center, but borrowing privileges will be restricted to Garden members. Further information on this center will be announced in a later issue of the *Bulletin.*

The library is also involved in attempts to increase its usefulness to other libraries, both within the state of Missouri and throughout the nation and the world. In the past year, over 200 inter-library loan requests submitted from libraries as far away as Hong Kong and Australia have been filled by our library's staff. In order to make its collections more readily available to other institutions, the library is now participating in two important projects sponsored by the Library of Congress: The *National Union Catalog* and *New Serials Titles.* These two projects are lists of books and journals owned by America's leading research libraries, providing bibliographic descriptions and locations for literally millions of items.

Tours of the library can be arranged for interested groups by calling 865-0440. □

–James R. Reed

DEGENERIA, THE LIVING FOSSIL

A species of tree which grew in the forest primeval is now growing in the Climatron. One of the most primitive flowering plants known, its scientific name is *Degeneria vitiensis,* and, except for a few display plants in botanical institutions, it lives only on the Fiji Islands in the South Pacific.

The tree is called a "living fossil" because, until its discovery in 1934, it was only known through the fossilized remains of the ancient Degeneria plants which lived millions of years ago.

Degeneria is living proof of the Continental Drift Theory. Under this theory, all the land masses of the world were once interconnected, forming one large mass. Each of the existing continents rested on huge plates of the earth's crust, which were constantly moving at extremely slow speeds, in various directions.

As the continents shifted in their various directions, some of them became isolated from others, islands were formed, and life forms were separated from their sources.

One land mass which remained intact during the beginnings of this activity 80 million years ago included what are now India, Africa, Madagascar, Antarctica, and New Zealand. The Fiji Islands were associated with this group of land masses.

As the multi-continent began to separate, some plants which were in existence at the time were separated from their original locations.

Degeneria, growing on the Fiji Islands, shares the same ancestors as many of the plants in Australia. When the Fiji Islands became isolated, Degeneria continued to grow as if in a time machine, remaining much the same throughout the years. Meanwhile, due to the larger area of land, the variety of other life forms, and the climate, the plants remaining in Australia continued to evolve. They changed, while their relatives in the Fiji Islands, on New Zealand, and in New Caledonia, another South Pacific island, remained essentially unchanged.

Until the 20th Century, the Degeneria tree was known only to the Fiji Islanders, who, having known it all their lives, didn't consider it unusual.

Then Albert C. Smith of the Arnold Arboretum discovered the tree in 1934, during a scientific expedition in the Fiji Islands. At the time, he didn't think it was a significant species. He noticed it had fruit and foliage which were unlike anything previously seen in the Pacific, but made no further attempt to identify it.

When Otto Degener, who had been a botanist and naturalist in Hawaii since the early 1920's, rediscovered the tree in 1941, the true significance of the species began to be known. Degener didn't claim original discovery of the plant. In fact, he specifically gives credit to Smith in his accounts of the rediscovery.

In 1963, some Degeneria seeds were planted at the National Arboretum, in Washington, D.C. Ten years later, there was one surviving tree from that planting, and it had outgrown the facilities there. Dr. Frederick G. Meyer, an alumni of the Missouri Botanical Garden, and Research Botanist in charge of the Herbarium at the National Arboretum, offered the tree to the Garden for display in the Climatron.

The tree, seven feet tall, was placed, on its side, in a large wooden crate and shipped by air freight to St. Louis, in mid-May. Since planted in the Climatron, it has shown three-four inches of new growth.

In their natural habitat, Degeneria may grow to be 100 feet tall; the branches and leaves are seldom seen, for the dense plantings under them hide the tops. Natives recognize the trees by the bark. The place selected for the tree in the Climatron provides the most favorable growing conditions — excellent light, good aeration, and perfect drainage.

The Garden's living fossil will be watched closely in the coming months and years. A Degeneria has never flowered or born fruit in "captivity." It is hoped the tropical environment created by the Climatron will be able to encourage the tree to flower.

It has not yet been determined whether the tree requires another tree to aid in pollination, which results in flowering and in the appearance of fruit. Hopefully, the addition of this tree will help answer that question.

Unlike most fruit, which usually is closed on all sides, the Degeneria fruit is so primitive that it remains open on one side. Its black pod-like shape resembles a small shoe and is actually called "black shoe" by Fiji natives. ☐

IN MEMORY OF A FRIEND

Clarence Barbre – May 15, 1890 – June 8, 1973

One of the best friends the Garden ever had was Clarence Barbre. There is scarcely a staff member who has not had the privilege of meeting him at sometime during the past 18 years. In May 1955, he retired from the East St. Louis plant of the Monsanto Chemical Company where he was Manufacturing Superintendent. Mr. Barbre started with Monsanto in 1933. His connection with the Garden was through his role as an enthusiastic instructor of adult horticultural courses, an activity that he maintained until November, 1972.

Mr. Barbre had three fascinations: teaching, science, and horticulture. His first teaching assignment was in a small country school in 1908. By 1915, he acquired an A.B. Degree from Eureka College in Illinois and a B.S. and M.S. from the University of Illinois at Champaign. All his degrees were in Chemistry. He then taught chemistry at the University of Southern California Medical School for a year before putting his scientific training to practical use in the chemical industry.

In his nearly 40-year long career as a chemical engineer, Barbre maintained his gardening interest. He was "like a farm boy who never got his hands out of the dirt", according to his son, Bob. Barbre's real gardening zeal was launched in 1935 in Webster Groves. In 1951, he started his nursery on the corner of Kirkham and Hillside where much of his horticutural enthusiasm was devoted to the culture of azaleas, a feat for which he was well known.

Barbre loved plants, but he also loved to teach about plants and had very definite ideas about the way they should be grown. People in his courses never forgot his straight-forward, factual manner of presenting the facts, a trait for which he was well known.

As an avid horticulturist, to say nothing of his career as a chemist, Barbre belonged to a number of professional organizations, a few of which included the Horticultural Society of Great Britain, American Horticultural Society, the St. Louis Herb Society and the National Arboretum Advisory Council. His function in the last organization was that of an advisor in methods of accomplishing long term objectives in research and public education.

His family has requested that a Clarence Barbre Memorial Fund be established at the Missouri Botanical Garden. Contributions in his memory may be sent to the Garden, 2315 Tower Grove Avenue, St. Louis, Mo. 63110. □

JAPANESE GARDEN TO BE DEVELOPED AT THE MISSOURI BOTANICAL GARDEN

The St. Louis Chapter of the Japanese American Citizens League has announced that the League will co-operate with the Missouri Botanical Garden in the planning of a Japanese garden, which is to be located in the southwest area of the Garden, near the lake.

The Citizens League will select and engage a prominent Japanese landscape architect, who will design the garden in cooperation with Environmental Planning and Design, the Pittsburgh firm which has been developing the new Master Plan for the Missouri Botanical Garden.

For many years, it has been the desire of the Japanese American Citizens League to have a Japanese garden, open to the public, planted in the St. Louis area. Mr. George Hasegawa and Mr. Richard Henmi have long worked towards this goal, and on June 25 the Garden's trustees announced that the Missouri Botanical Garden is to be the site.

The Japanese garden springs from the intense love of nature which has always been a characteristic of the Japanese. Their subtle and delicate taste has produced a type of garden which is a true work of art. Japanese gardens provide in miniature an abstract composition of the natural world – a few stones representing mountains, small trees suggesting an expanse of wooded land. Planned as a thing of beauty in all seasons, bare winter branches and snow have aesthetic appeals of their own.

With the location at the Missouri Botanical Garden, hundreds of thousands of people will have the opportunity to enjoy a special heritage of the Japanese. □

Proceeds from the BAL ORIENTALE, the benefit which will be held the evening of September 21 at the Garden, will be used to develop the Japanese Garden.

Missouri Botanical Garden
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Gardening in St. Louis

GARDENING IN JULY

Grass may be beginning to burn out. This is caused by cutting it too close to the ground, or lack of feeding earlier in the year. Water is needed to the equivalent of two inches of rain once every ten days.

Summer mulches should be applied to areas not covered earlier to protect moisture and keep roots cooler. Check on other mulches to see that no weeds are showing through. If so, remove at once. Keep weeds under control. They also make good mulch if seed was not allowed to set before pulling or hoeing.

Check house plants outdoors for moisture needs, and feed and trim to keep in shape and good health.

Fresh vegetables are now at their peak. Beans, beets and carrots can still be planted. Prune excess growth from tomatoes to encourage more fruit.

Add weeds and other refuse to compost heap. Keep compost pile moist at all times by watering heavily at two-week intervals to encourage rapid breakdown.

Perennials may be started from seed now. Buy good seed and follow normal procedures for treating seed and seedlings. Plants will be a good size to go into permanent areas in mid-September. Try sweet william, columbine, candytuft, coreopsis and many others.

This is the month to divide iris and set out new roots; also divide day lilies and reset Madonna lilies. Order lilies for planting in October. Many varieties are sold out early. Many hardy lilies may be seen next year at the Garden from orders placed in late June for planting in October in the Knolls amongst the new shrubs.

Keep your garden notebook up to date and jot down changes you see now that can improve the garden for next year. Record good varieties that you wish to add, recording how used, color and height of plants.

Avoid feeding trees and shrubs from now on so as not to encourage late soft growth that may be winter killed due to plant not hardening off early enough in the fall.

Later this month, cuttings should be made of coleus, geraniums, everblooming begonias and other plants that may be needed for the house next winter. Root in moist sand or perlite and peat. It often helps geranium cuttings to root if they are allowed to dry in a shady, airy place for several hours before putting them in the rooting medium.

Hardy mums should have their last pinch made by the middle of the month. Give a good feeding of liquid fertilizer to get better flowering later on.

Oriental poppies have become dormant by mid-July and may be divided successfully now. If roots are cut into two-inch pieces and planted in good soil, most of them will develop new plants.

Wisterias may be heavily pruned now to control growth and encourage better flowering next spring.

Red spider mites do much damage to evergreens and other plants at this season, particularly when the weather is dry. Their presence is to be expected when you see fine webs and leaves appear pin pointed and light in color. Needles turn rusty. Spray with malathion, aramite or kelthane in early July and repeat in 10 to 12 days as needed. Do not use on fruits and vegetables.

Be sure to turn the compost pile over once during the summer to get the outside of the pile into the center where it will rot. ☐

ALL AMERICAN ROSE NEWS

The Missouri Botanical Garden again has on display the new rose introductions for 1974. One hybrid tea rose, "Perfume Delight," is a richly fragant clear pink and is the only hybrid tea award for 1974. Two floribundas were picked for All American 1974 awards; "Bahia," an exceedingly floriferous orange-tinged pink floribunda, which is an attractive, shapely plant and has good disease resistance; all good qualities in a top rose. "Bon Bon," another All American floribunda is a delightful pink and white bi-color. The flowers are produced in large clusters and the plant has good resistance to blackspot and is exceptionally mildew reistant.

These new roses have all been grown in our official test garden the past two years and are the ones that received the top ratings in all test gardens throughout the United States and Canada. These roses, along with all other recent award winners, may be viewed at any time, in the south rose garden.

Some hints for your roses: Be on the lookout for mites. We like to get a prohibitive spray of Kelthane on by the end of May, then repeat as needed. Due to the late frost, there was considerable damage and care is needed to prune out dead wood as it shows up to prevent disease. Blind wood is also a problem and should be pruned out to open to plant to better air circulation and allow the strength to go into good growth. ☐

GERHARD MARCKS
German, born 1889

THREE GRACES
1956
Height: 42 inches
Bronze
Lent by Dr. and Mrs. Thomas S. Hall

This lovely sculpture, which was included in the 1965 Sculpture Exhibition at the Garden, will be on display for the remainder of the year, in the pool in front of the Camellia House. Dr. Hall is a professor of biology at Washington University, and since May has been representing Chancellor William Danforth of Washington University on the Board of Trustees of the Garden.

a celebration of nature

A SUMMER STAGE

What better setting is there for a series of outdoor performances of music and theater than in a botanical garden? The Missouri Botanical Garden provides a natural stage for the performing arts.

With lush green foliage surrounding a natural amphitheater in the area southwest of the Climatron, Shaw's Garden has become the newest location for outdoor concerts.

This summer, the Garden is bringing to the people of St. Louis a program of music and theater designed to appeal to a large audience. Children will have a choice of four children's theater programs in July. Young people will have four programs of music, designed to appeal specifically to them. And for adults, we've scheduled a symphony orchestra, theater, folk music, and much more.

SCHEDULE

July 15, 2:00 p.m.
Children's Theater – Metro Theater Circus

July 19, 7:30 p.m.
Music – Kirkwood Symphony Orchestra

July 21, 2:30 p.m.
Folk Music – The Boyers

July 22, 2:00 p.m.
Children's Theater – Rosie and Our Gang

July 28, 2:00 p.m.
Children's Theater – Rosie and Our Gang

July 29, 2:30 p.m.
Music – The Legend Singers

August 4
Music – To Be Announced

August 5, 3:30 p.m.
Theater – Saturday Night Leftovers

August 11, 2:00 p.m.
Music – St. Louis Jazz Quartet

August 12, 2:30 p.m.
Music – Sing Out Florissant Valley

August 18 – 2:00 p.m. & 3:30 p.m.
Cahokia Indian Dancers

August 25 – 3:30 p.m.
Music – Sing Out St. Louis

August 26, 2:30 p.m.
Music – Young Audience Folk Ensemble

MISSOURI BOTANICAL GARDEN BULLETIN
2315 Tower Grove Avenue
Saint Louis, Missouri 63110

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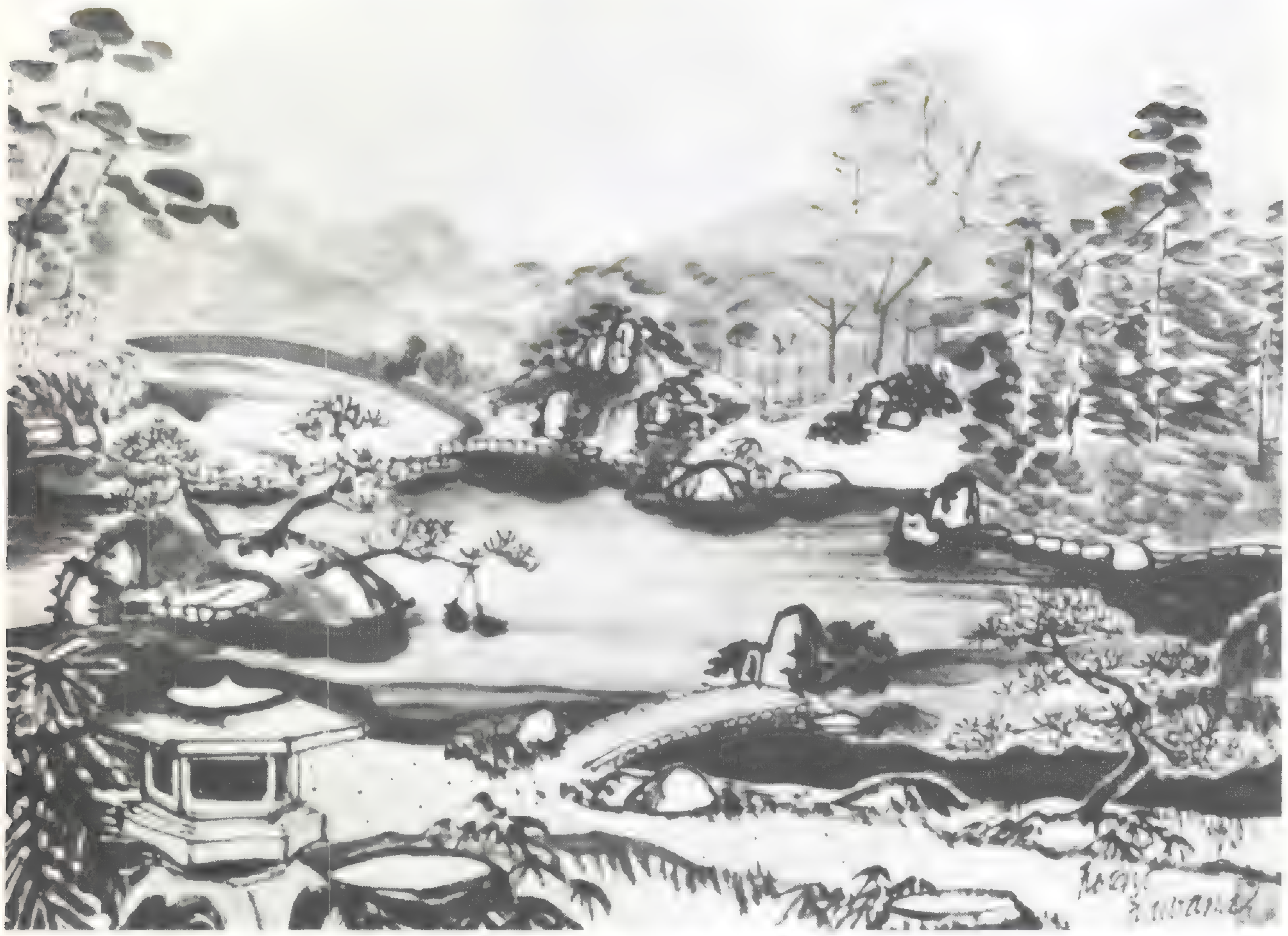


While plans are still very much in the formative stages, Prof. Kawana's sketch depicts the general design for the Japanese Garden. Future plans will develop the stages leading up to the view shown here.

JAPANESE GARDEN PLANNED FOR LAKE AREA

A Japanese garden, according to Koichi Kawana, gives the visitor "an opportunity to meditate in an environment which brings him closer to nature's more peaceful side." Kawana, professor of environmental design at the University of California, Los Angeles (UCLA), is the designer selected by the St. Louis Chapter of the Japanese American Citizens League to plan a Japanese garden near the lake in the southwest corner of the Missouri Botanical Garden.

"This garden could be developed in several stages," Kawana said when he visited the Garden in July. His proposal includes, as an appropriate beginning, a dry garden in front of the lake. Through gradual additions the Japanese garden will evolve to include many elements in the design pictured above. Plans call for the enlargement of the lake, possible additions of islands and the incorporation of a waterfall which Kawana suggests as the focal point for the garden. The final design will harmonize with existing features of the landscape, utilizing many of the trees now growing in the area. A Japanese stone lantern which was part of the Imperial Japanese Garden constructed for the 1904 Louisiana Purchase Exposition will be one of the primary features of the new garden.

The Japanese use natural elements in their gardens to re-create nature in miniature. Water is used to reflect a variety of moods. Stone brings color, texture and form into the garden. Natural wood, without varnish or paint, adds to the beauty. The plants which are chosen suggest the kinds of natural scenes which the garden portrays. Kawana plans to make use of the plants and stone which are native to Missouri. In addition, plants will be collected in various locations in Japan which have climates similar to that of St. Louis.

Kawana is an authority on traditional Japanese gardens. Educated in both Japan and the United States, Kawana is well acquainted with the various methods of adapting authentic Japanese gardens to the American environment. He is also the nation's first recipient of the Master of Arts degree in Environment Design.

Proceeds from the Bal Orientale, which is scheduled for the evening of September 21, will help to fund the construction of the Japanese garden. The design is a gift from the St. Louis Chapter of the Japanese American Citizens League. ☐

Volume LXII Number 7

September, 1973

COME TO THE GARDEN THIS FALL TO A CLASS, TO A WORKSHOP, TO A LECTURE, TO A DEMONSTRATION

At gardening workshops, the horticulture staff and experts from the St. Louis area, engage in hearty discussions with participants – on the best methods of plant care in our area.

Classes for adults, in horticulture, natural history and botany, meet in single sessions, or in series throughout the year. The complete brochure of this year's fall offering will be in the mail, to members, soon.

Saturday Nature Programs, children learn how to make a terrarium, how to sow seeds; discover the mystery of the orchid, and insectivorous plants. Classes are held on Saturday morning, from 10 to 11:30 a.m.

Thousands of students from the St. Louis area take part in Education Department programs. Teachers and their classes attend lectures and workshops in the plant sciences. A student from Litzsinger School plants a seedling in the horticultural workshop – the first class of deaf students to participate in the Garden's education program.

A grant of $21,690 was recently awarded to the Education Department of the Garden from the Cooperating School Districts of the St. Louis Suburban Area, Inc., for the purpose of expanding programs for children enrolled in school districts which are participating members of the organization. The grant also enables at least five workshops for teachers to be held during the coming academic year. □

EXPEDITION TO BELIZE

Dr. John Dwyer has been a Research Associate at the Missouri Botanical Garden for seventeen years, and is Professor of Biology at St. Louis University. He led a collecting expedition to the Maya Mountains in Belize, formerly British Honduras – one of the very few land areas in Central America we know to have been there throughout the history of flowering plants – more than one hundred million years; most of the rest of Central America had been under water. This is his personal account of the expedition, from which he very recently returned.

Expectancy is the feeling upon arrival at a foreign airport – the immediacy of facing customs and the emotions of establishing rapport with different people, customs, climate. Belize (formerly British Honduras), being English speaking, is different in this respect from all the other countries of Middle America. As we fumbled for our passports on the 23rd of May, at the only significant airport in this little country south of Yucatan, Mexico, we wondered what lay ahead.

We were obviously not tourists. The fourteen pieces of baggage on the customs' rack attested to that. When we departed from Miami Airport, a couple of hours earlier, a by-stander inquired whether we were headed for an African Safari. True, it was a safari of a kind! The plant presses were a give-away that we were botanists out to collect plants. Our mission: to initiate a botanical survey of the Maya Mountains which cut diagonally through southern Belize. Despite being one of the oldest land formations in Middle America, few plant collectors have ventured there. The mountains were bound to be fruitful collection grounds – the National Geographic Society which advanced the money for the expedition thought so. And so did Dr. Peter Raven, Director of the Missouri Botanical Garden, who encouraged us in the venture.

By "us" is meant Dr. Thomas Croat, curator of the Herbarium at the Garden, Dr. Alwyn Gentry, Associate Curator, and myself. Though all of us are experienced collectors in Middle America, two had no experience in Belize. Months had gone into planning the trip; five-hundred pounds of collecting equipment had already been air-cargoed from St. Louis – from propane heaters (to dry the plants) to newspapers – from tents to axes.

As the warm tropical air enveloped us, we glanced around. Off to the side of the solitary runway were sand bags piled up to form a machine gun nest, beyond was military radar equipment – not far away was an army camp over which flew the flag of Great Britain. This reminded us that Belize has a major problem with adjacent Guatemala which claims Belize as part of her territory. During our five weeks of field work, Belize was to announce her nominal independence from the United Kingdom. The barracks were still there, however, when we departed.

We spent a couple of days in quaint Belize City, where the smell of salt air reminded us how far we were from St. Louis, and how far St. Louis is from the ocean. Beyond the shore lay the famous cays and the second largest barrier reef in the world. But our work was terrestrial, and anyway, there aren't many plants on the cays.

Our base of operations was to be a bungalow on the banks of the Belize River only three miles from the airport. This was made available to us by Mr. Robert Baumgartner, an industrious American living in Belize, who owns a mechanized farm, a showpiece called *Ridge Lagoon Plantation.* The bungalow, with electricity and refrigeration, was to play a major role in our success. The house, elevated in a manner reminiscent of summer homes along the Meramec River because of seasonal flooding, has an open area at ground level, ideal for our plant pressing and drying equipment. The general surroundings were idyllic. A few yards away was an orchard of exotic shrubs and trees with a "built in" sprinkling system. Adjacent to this was a greenhouse, pleasing to our botanical eyes. As a final touch, there was a large pond with about 30 swans, to remind us that animals are beautiful too.

Despite the luxuries, the plants we sought were far from our headquarters. Our decision was to drive to the collecting grounds in the Maya Mountains, put our plant samples in plastic bags or in newspapers, and return to home base for further processing. It was a kind of "hit & run" technique, allowing us to process a great number of collections at the base camp. It required taking a rented pick-up truck, loaded with collecting equipment, and food (often enough for several days) over usually rough gravel roads. To get a little ahead of the story, we were eventually to air-cargo 64 cartons of dried plants, weighing 1100 pounds, to the Missouri Botanical Garden for study and distribution to major herbaria of the world.

During our five-week stay we employed two natives of Belize as guides. One, a Mayan Indian, Marciano Popp, from San Antonio (Toledo District) spoke Quiche, Spanish, and English; the other, Angelo, from San Ignacio (Cayo District), and expert forester, is bilingual in Spanish and English.

One of the chief collecting sites was Cuevas (Las Cuevas in Spanish means the Caves), well into the Maya Mountains. There one finds caves with Mayan artifacts which are under protective surveillance by the Belize Government. Cuevas is the terminal point of a deep rutted muddy road. The actual terminus is

The MISSOURI BOTANICAL GARDEN BULLETIN is published 10 issues per year monthly except January and August, by the Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Mo. 63110. Second class postage paid at St. Louis, Mo.

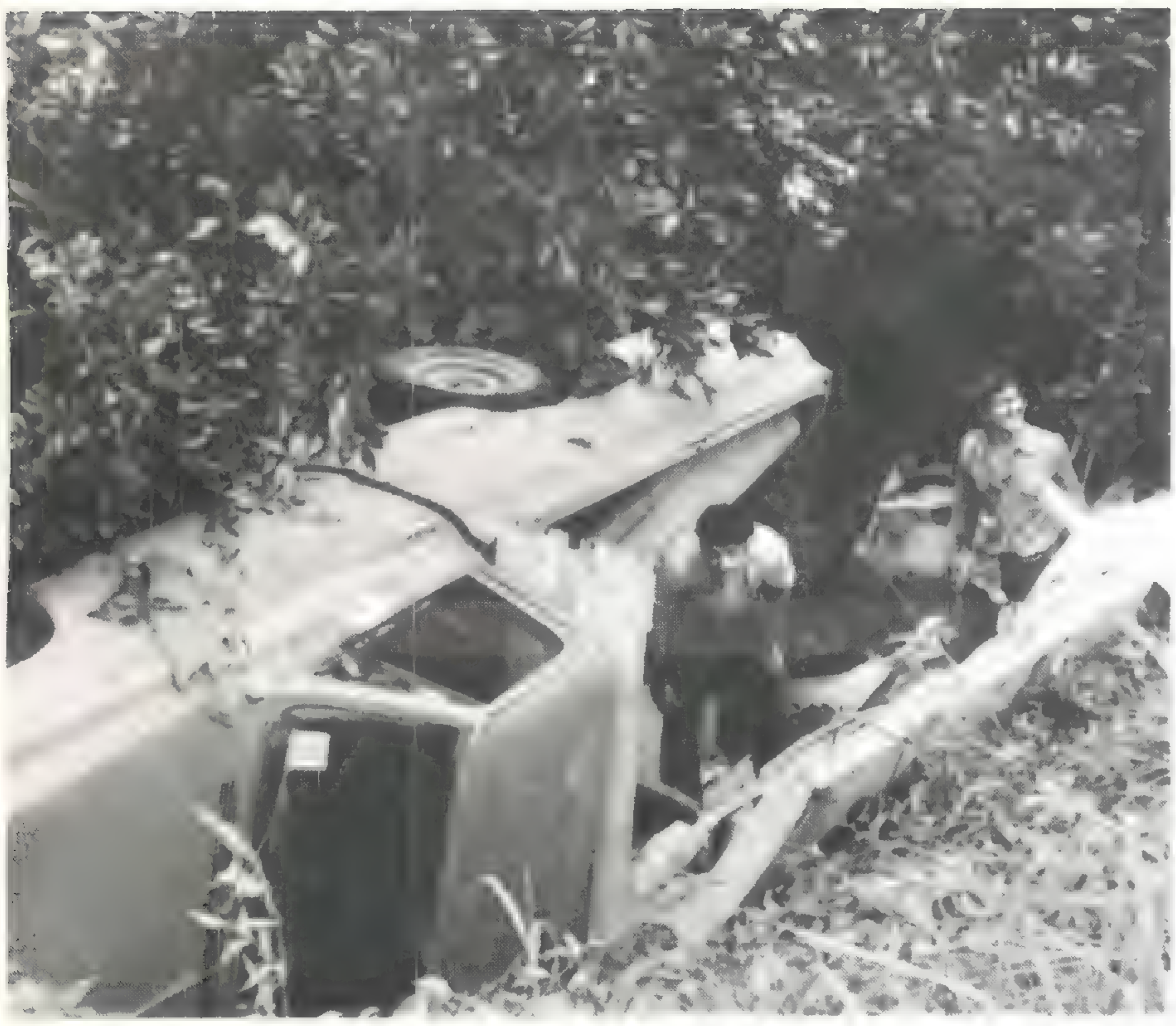
Lorine H. Compton, Editor

SUBSCRIPTION RATES:
$5.00 per year. $6.00 foreign.

Little John's Camp, a well known rendezvous for jaguar hunters. The forests have a labyrinth of logging roads, a circumstance which facilitated our botanical collecting. The Maya Mountains have long been exploited for mahogany wood and chicle; the larger mahogany trees are almost all gone – the chicle no longer has much of a global market, inasmuch as substitutes are being used by chewing gum manufacturers. Despite the ravages of man's incursions, flowering plants and ferns are there in abundance and we worked well into the evening. On one occasion we worked, ate and slept in an abandoned lumber mill. Its silenced wheels and belts were in strange contrast to the wall of forest vegetation vitalized by the exotic songs of birds. On another occasion, we drove along a deep rutted road, south of Cuevas, until the Rio Flor stopped us. Our eyes were constantly turning toward the sky. Had it rained, we certainly would have been stranded there for one or more days, as the roads turn into greasy, muddy ruts. It is lonely there too. In many hours of driving we had seen only two humans, reminding us that Belize does not suffer from population pressure.

In our brief stay in Belize we discussed in panel fashion, before some forty members of the local Audubon Society, our impressions of the vegetation of the country and the progress of our field works. Radio Belize invited us to discuss via National Radio our project, including the relation of the Missouri Botanical Garden to the field work. Last but not least we invited Mr. Bruce Vanderveen, a prospective doctoral student at the Missouri Botanical Garden, to work with our team. Later, we drove him to Lake Yaxha, near Tikal in Guatemala, where he continued field work in archaeology and botany at the camp of Mr. Nicholas Hellmuth, a native St. Louisan, the son of George Hellmuth, of the architectural firm of Hellmuth, Obata, and Kassabaum.

Plant collecting is fun coupled with hard tedious work. The justification for all this lies in the scientific fruits of the labors. In truth the harvest is difficult to assess. The plants, when dried, identified and mounted on standard herbarium sheets, and filed in the compactors of the Missouri Botanical Garden or on the shelves of herbaria in America and abroad, seem lifeless. Like books in any library, however, they are vitalized and rendered significant by the humans consulting them. Herbarium sheets, be they from Belize or the U.S.S.R., attract students (whether in person or through correspondence or by borrowing material) with a wide variety of interests – one can be working on an ecological problem in Panama demanding critical identification of plant species – another may be working out the global distribution of drug plants – another searching out the name of a Costa Rican orchid. The herbarium, in a sense, contacts the world. It is a vegetational cosmos, which is not sere and dry, but a representation of the earth's verdure. Someday, through our efforts (and those of



other plant collectors) in Belize, we hope to produce a useful manual of the vegetation of this newest of countries.

Working at Cuevas, we were attacking the Maya Mountains from the north. We decided next to approach them from the south by collecting at the Columbia Forest Station near San Antonio (Toledo District). This is milpa country where the modern Mayan Indians, like their ancestors of pre-conquest days, cut the forest and burn the vegetation to plant corn. The Forest Station, fortunately, is protected against the ravages of the milpa system.

En route to San Antonio we experienced our first accident. Our pick-up, forced by a stubborn bus to back up on an elevated road designed for one and a half vehicles, slipped off the shoulderless edge, turned over one and a half times, and came to rest on its side against a large orange tree in a citrus grove. Fortunately, the botanists emerged from the vehicle uninjured. All the collecting gear was scattered in the orchard and the wooden superstructure of the pick-up "pan-caked." After Dr. Croat chopped the tree down, the vehicle righted itself. In utter amazement, the native spectators watched us drive out of the orchard and onto the highway. We drove a few miles to the sea shore town of Stann Creek where two Jesuit Fathers (both from the Missouri Province) allowed us to use their power tools and lumber to repair our collapsed wooden superstructure.

While at the Columbia Forest Station the discovery of a Mayan City proved exciting. When we casually asked the father of our Indian guide whether he knew of any ancient ruins of a Mayan City in the vicinity, his affirmative reply was just as casual. Dr. Gentry, who represented our team in the city-searching, returned from the depths of the jungle in a few hours to announce that the city was there, its temple covered with hundreds of years of dirt and rubble and decades of trees. Alas, we were not city searchers but plant collectors and we had our botanical work to do!

Field work, like all human projects, is successful only when the team receives the cooperation of the local government and private citizens. Obviously, our work could not have been initiated without the generous support of the National Geographic Society. To the Belize Government, especially the Premier, His Excellency, George Price, who followed our work with interest and to Mr. Bradley of the Forestry Department who granted us our collecting permit (and whose herbarium will receive a set of specimens of species collected) we wish to express our thanks. To Mr. and Mrs. Robert Baumgartner, our unofficial hosts who supplied the bungalow, and to St. John's College of Belize City, staffed by Jesuits from the Missouri Province, we owe a debt of gratitude. The British Army was most helpful in flying Dr. Gentry by helicopter to the foot of Mount Victoria, the highest peak of the Maya Mountains, returning in twenty four hours to literally airlift him and his plastic sacks of plant samples to the doorstep of our bungalow. □

GARDEN RESEARCHERS RECEIVE GRANTS

Three grants have been awarded to the Garden by the National Science Foundation. Dr. Peter Raven, Director of the Garden is the recipient of a $175,000 grant to do a five year study on the Evening Primrose family. Dr. Alwyn Gentry has received $25,000 for studies of the Trumpet Vine family. His grant is for a two year study. The final grant is to Dr. Gerrit Davidse for a two year study of an important genus of grasses found both in South America and in Africa. Drs. Gentry and Davidse are both Assistant Curators of the Herbarium. □

TRIBUTE TO DR. EDGAR ANDERSON

The Garden has just published a symposium dedicated to Dr. Edgar Anderson in a special issue of the *Annals*. While some of the articles are technical, scientific contributions, there are also reminiscences by some of Dr. Anderson's students, a complete list of his publications (scientific and popular), and a biography.

Copies may be ordered for $7.00 from:

ANNALS
MISSOURI BOTANICAL GARDEN
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Gardening in St. Louis

GARDENING IN SEPTEMBER

September marks the ending of a long, hot, dry summer and the gardener is anxious to get back into the fall gardening chores. This is the best month to take stock of the situation and to prepare now for the season starting next spring.

One of the first essential things to do is to start on a thorough cleanup program, removing any dead or diseased material, or plants that have produced seed and have completed the cycle for the year. Weeds should also be thoroughly cleaned up now, and, in some cases, pre-emerge applied so as to prevent any further weed seed being distributed this fall and to give a good start for next spring.

This is the best month to renovate or start a new lawn. In renovating the lawn, the area, if compacted, which many are, should be aereated. Many lawns need to be re-thatched; a rich top dressing applied, using a rich top-soil with good organic matter such as peat moss or compost applied to a depth of half an inch over the entire lawn area after it is thoroughly cleaned up, a well-balanced fertilizer and new seed added and raked in lightly. The lawn then should be kept moist until we get into a regular pattern of rainfall so that the lawn gets established. New lawn areas should have the ground well worked up and enriched with organic matter to a depth of 12 to 15 inches deep, applying 4 to 5 inches of organic matter. This should be well incorporated with the addition of lime, if soil tests indicate, and raked to fine grade of tilth – all hollows raked out and then apply the fertilizer and grass seed, raking in lightly, rolling, and then keep moist. Lawns, then, are well established for the cool weather for growing.

In purchasing lawn seed, make sure you get seed of good quality – it is worth paying more than to buy cheap seed, which can be a source of future problems.

Insect and disease control should also be watched for continually; spraying with Pyrethrum, Rotenone or buying the two combined in the form of DX. Others that can be used with extreme care are Diazinon or Malathion. Follow directions on container and keep out of reach of children.

Perennials are best divided now and replanted as needed. This is an ideal month to add peonies to the garden, or to divide peonies that have been in for a number of years but have stopped flowering. The perennial garden benefits from the addition of organic matter and bone meal, well incorporated in an around the plants that are there, or incorporated into the area before setting new plants in.

Areas that are thoroughly cleaned up will also benefit by the applying of mulch of partially decomposed compost or wood chips to a depth of 2 or 3 inches to conserve moisture and to prevent weeds from growing. This will also prevent the ground from freezing and thawing during the winter months.

Spring flowering bulbs will be on sale and although they don't need to be planted immediately, tulips are best held off until mid-October, bulbs should be purchased now while the best varieties and sizes are available. All members of the narcissus family should go into the ground by late September, if possible. Crocus and snowdrops, scillas and other small bulbs can be planted when they can be obtained. Bulbs for forcing, such as tulips, daffodils or hyacinths are best placed in cold frames, covered with a layer of straw or similar material, then 5 to 6 inches of soil placed over the top of that, the area kept moist and bulbs left there until late December before trying to bring them indoors.

Strawflowers or everlastings are to be picked when the buds begin to open, tied loosely in bunches and permitted to hang, head-down, for several weeks while they dry.

Lily bulbs should be ordered as soon as possible. Most of these will not be available for delivery until mid-October, but Madonna lilies are available in early September and should be planted as soon as they can be purchased. Do not allow them to set around and dry out. Consider planting lilies not only in the perennial border, but in areas that receive shade, such as in among shrubbery or under trees where they get just some filtered sun. They do well under these conditions and add a note of color, and by a wise selection can be in bloom from early May to mid-September.

Fall flowering perennials should not be divided at this time, but should be left until spring.

Calla lilies which have been resting in pots for the summer should be repotted now.

Gourds for winter decoration should be picked before they have been touched by frost. The stems should be cut off about two inches from the fruit, which should be taken into the house to dry.

Bulbous iris may be planted this month. They should be given protection with a light mulch of leaves or other similar material before the ground freezes. Bleeding hearts can be divided safely in the fall, separated the same way as peonies.

The lily of the valley gives best results when separated every 3 or 4 years. This work may be done in early autumn. The strongest pips should be selected and planted 3 inches apart, just below the surface. Gladiolus corms should be dug when the leaves turn yellow. It is well to cure them for a few days in the sun.

Daylilies (Hemorocallis) make strong growth and should be divided at least every 5th year. They are very accommodating; this work may be done at almost any time.

The portable cold frame should be set up by mid-September, and with good soil preparation, makes an ideal place to sow radish, lettuce and spinach for use later on when the weather gets cooler. Parsley may also be added to the cold frame for use during the winter months.

Ornamental trees, shrubs and evergreens are best set out in the fall when good choices are available. Evergreens can be successfully planted starting late this month. Orders should be placed early at the nurseries and it is advisable to go out and select your own plants, have them tagged and delivered at planting time. The area where these plants are to grow, should be well prepared ahead of time, removing most of the old soil and replacing with equal amounts of good top soil and organic matter prior to planting. No commercial fertilizer should be used around these until they are well established the following year.

Deciduous trees and shrubs will not be available for planting until later in October; usually after the first light frost or leaves begin to fall. But, again, we cannot recommend too strongly selecting your plants at the nursery yourself and having them delivered at planting time. Deciduous hedges, particularly privet, should be trimmed for the last time this month. Pruning of dead wood or branches that are rubbing against one another can still be done on trees in the area while leaves are there. Some trimming can still be done, although not too much.

Continue a good watering program, equalling at least two inches of rain at weekly or ten day intervals until we get back into a regular pattern of rainfall. Do not apply fertilizers to any tree or shrub areas, as you want these plants now to harden off for the winter months. Chrysanthemums coming into bud can be heavily watered and then moved to other areas where you want color. Keep them well watered the first few days after transplanting.

September is a good time to start the compost pile, using weeds and other debris from the garden. Later, you can add leaves. It is advisable to start with a layer of course material interspersed with finer material in between. Keep the pile wet and add some old compost to each layer to encourage a faster breakdown by incorporating the bacteria which is present in the old compost.

House plants set out for the summer should now be cleaned up and gradually moved indoors as the month advances. If insects are present, spray the plants and check to see if plants are root-bound. Repot, if necessary, and prune to control shape and size.

Cuttings of geraniums, coleus, begonias, etc., made now will make ideal plants for indoors.

The home greenhouse should be thoroughly cleaned out if not done before this, washing frames down, scrubbing any woodwork and spraying with a good fungicide throughout the whole area before starting new plants. Cuttings of many of the above plants or others to be carried over from one year to the other can be started this month, well rooted and carried in the greenhouse for the winter months. Many of these, if grown in individual pots, will add color indoors and can be moved back and forth. Usually all that is necessary is enough cuttings taken for stock plants, which, well grown, will supply sufficient cuttings early next March to start new plants for setting back outdoors. Impatiens can be carried over very well this way, and is a plant that is very useful in the shady areas.

For those attempting to flower poinsettias for Christmas, the plant should be given lots of light during the day, but placed in a dark room from 7 p.m. until 7 a.m., otherwise they will fail to bloom. □

PLANT SALE – OCTOBER 13th

The Annual plant sale being held in the Floral Display House will again feature many of the popular plants for home and office use. Every effort is being made to have many unusual items suitable to the grower who is looking for the unusual plant for growing in the home.

Special 10% Discount to Members.

FALL GARDEN WORKSHOP

The Fall Garden Workshop will be September 8th and 9th from 9 a.m. to 4 p.m.

Having a problem with your lawn, preparing roses for winter, deciding what bulbs to plant for early spring color, or wondering when and why evergreens should be planted? Come to the Garden for answers to these and many other questions. All aspects of what to do for the garden this fall will be covered and will include new ideas to cut down on work and yet have a better lawn or garden next year.

Approximately 20 different booths will be set up and staffed by members of the garden and other experts in the field, so a wealth of information is available, along with special handout material to take home for continuing use. □

ST. LOUIS HERB SOCIETY PRESENTATION TO THE GARDEN

The annual sale of herbs by the St. Louis Herb Society was held in the Floral Display House on April 28, 1973. Members of the society work throughout the year propagating plant material for the yearly event. The purpose of the sale is to promote the knowledge and appreciation of herbs by making them available to the people of the St. Louis area.

Mrs. Frank McGuigan, center, and Mrs. Clark M. Driemeyer, right, presented a check for $6000 to Robert Dingwall, Chief Horticulturist, as a contribution from the Society to the Garden, derived from the proceeds of the sale. The donation will be used to make possible improvements in the greenhouse facilities.

CALENDAR OF EVENTS

ADULT COURSES—Conducted in the John S. Lehmann Bldg.

September 26 and October 3	Edible Wild Plants 10-11:30 a.m. Fee: $8, Members $6. Instructor: Kenneth Peck
October 2, 9, 16 and 23 Section A	Plant Propagation from Cuttings — Section A, Afternoons 1-2:30 p.m.
October 4, 11, 18 and 25 Section B	Section B, Mornings 10-11:30 a.m. Fee: $16, Members 12. Instructor: Kenneth Peck

CHILDREN's SATURDAY NATURE STUDY

September 29	Table Top Greenhouses (Bring plastic bag large enough to cover) 50¢
October 6	The Forests of the Rocky Mountains
October 13	Pond Life
Octber 20	NO CLASS
October 27	Planting Bulbs (Bring a 1-lb. coffee container) 50¢

SPECIAL EVENTS

August 25 thru September 3	Henry Shaw Cactus Society Show — Floral Display House
September 8, 9	Fall Garden Workshop Floral Display House 9 a.m.—4 p.m.
September 15,16	Harvest Show — Men's Garden Club — Floral Display House — Saturday 12 noon — 5 p.m. Sunday 9 a.m. — 5 p.m.
September 21	Bal Orientale
September 29, 30 & October 1	Dahlia Society Show Floral Display House 9 a.m. — 5 p.m.
October 13	Plant Sale Floral Display House
October 14	Ronald Arnatt Chorale — 8:00 p.m.
October 26	Preview Party — 5:30 p.m. Floral Display House
October 27 thru November 12	Chrysanthemum Show

MISSOURI BOTANICAL GARDEN BULLETIN
2315 Tower Grove Avenue
Saint Louis, Missouri 63110

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BAL ORIENTALE

September 21 -

For the creation of the Japanese Garden

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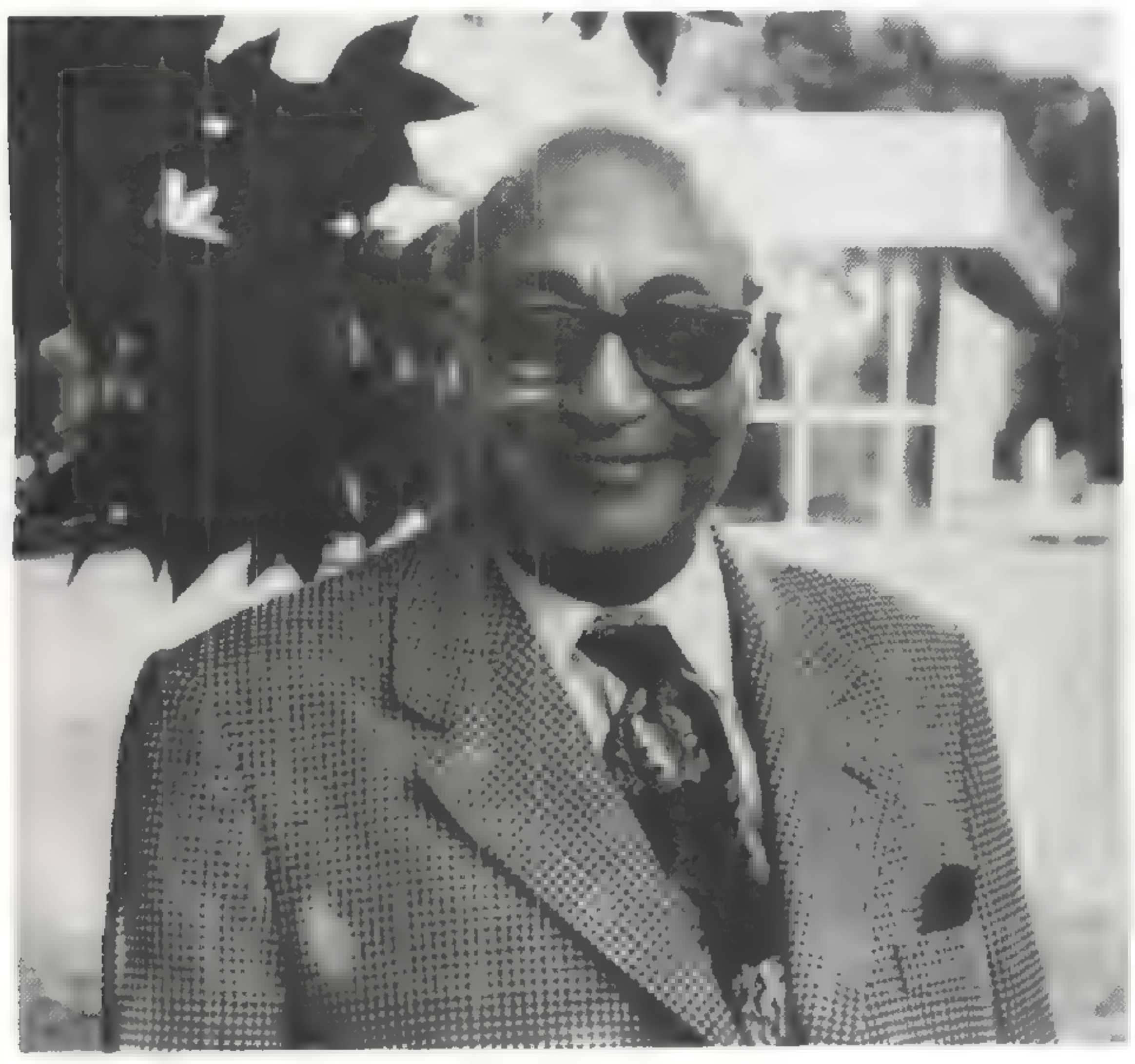
Missouri Botanical Garden Bulletin

An institution of international renown, the Missouri Botanical Garden's library/herbarium is an important link in the world-wide system of information about plants. Scientists and researchers from the world over come to St. Louis to use the outstanding facilities here.

. . . From Australia

. . . From Great Britain



. . . From Iran

. . . From Great Britain

. . . From New Zealand

. . . From U.S.S.R.

Volume LXII Number 8

October, 1973

WHY DO LEAVES TURN COLORS?

Why do leaves change from their various shades of summer green to the brilliant colors of autumn. Here again is one of those seemingly simple questions, which upon examination turns out to be not so easy, after all. Like the questions asked in the previous article on flowers and their blooming habits, this one begins with a natural event common to all of us. And, again the search for an answer leads us to further understand and appreciate the intricate beauties of nature's design.

What questions might we ask ourselves and think about as we hike on a crisp autumn day? Why *do* those leaves change colors? Why are some plants' leaves more colorful than others? Why do the colors vary from place to place, from year to year? Why do many trees lose their leaves in winter while others do not?

Books do not give us very adequate or straight answers to these "simple" questions. If we are to satisfy our curiosity we must take to the woods for our own observations, and then perhaps consult our botany texts to fill in the blank spaces of less observable information (such as in this case, some chemical properties of plant tissues). So let us try a few of our questions and look for some answers.

Those who pay attention to their trees know that, contrary to popular opinion, the frost seems to have little direct effect on the turning of leaves in the fall. Many plants (for example the sumac and sassafras) are turning colors in September, well before the first appearance of Jack Frost. Tree watchers in the St. Louis area certainly learned last fall that cloudy rainy weather is not particularly conducive to the brilliant colors that we have come to expect here in the Ozarks. And, if you can remember back another year, you may add to your inventory of evidence that extremely dry, late summers and autumns also yield a very unspectacular and dull fall season.

What else can we find to solve our puzzle? The observant autumn hiker may also notice that in general trees on hilltops or south facing slopes are often brighter than those in deep valleys or north slopes, and that a lone oak in a meadow is usually more colorful than one in the forest surrounded by other oaks. And perhaps he will even note that the outside leaves on that lone oak tree are more colorful than those near the trunk.

Referring now to our books for a few final bits of information we can begin to make some sense out of the problem. Since we are interested in color, we read the discussion on plant pigments, and find that three important pigmented substances are found in the leaf tissue of most plants. They are the carotenoids (yellow and orange in color), the anthocyanins (blues and reds), and chlorophyll. The green chlorophyll is, of course, the substance primarily responsible for photosynthesis. This manufacture of food is a major function of the leaf, and thus it is not surprising that during the growing season most leaves are green, indicating a preponderance of chlorophyll. In the fall, however, the leaves are dying and as the chlorophyll begins breaking down, the less common pigments previously masked by the overwhelming green begin to show through. The yellow color grass turns, if covered for a period of time by a board, is the carotenoid compound showing through after the chlorphyll is greatly reduced by the lack of sunlight.

The red and purple tints of the anthocyanins are a bit more complicated. The presence or absence, and color of these compounds is determined by both hereditary and environmental factors. Some plants (such as privet or lilac) are not able to manufacture these compounds and as you have no doubt observed, do not turn red. When these compounds are produced, however, their color varies according to the acidity of the leaf. A low pH (acid) produces blue tones; high pH (alkaline) creates the scarlet red colors. The formation of this compound is apparently stimulated by cool (but not necessarily freezing) temperatures, and the presence of sugar. Thus the importance of cool nights and the sunny days which enable the leaves to produce high levels of sugar.

But why do the leaves of some trees die and fall off in the autumn, while others are evergreen? The severity of the winter climate with its freezing temperatures and other harsh conditions poses a difficult problem to both plants and animals. Some of the many and interesting ways (of which deciduousness is one) in which they deal with the winter season will be discussed in the January issue of the Bulletin. Before that time, however, we need to be making our observations in the field. Since autumn is the time of great activity in preparation for winter in the natural community, it is also a very good time to visit and make some observations about these winter adaptations.

The Arboretum offers 2200 acres of diverse natural plant communities, miles of quiet trails for hiking, and on Sundays a wilderness wagon to provide a colorful ride through our beautiful Ozark landscape. Now that you know more about why the trees are turning colors, you can watch the weather and predict the best day to visit the Arboretum and enjoy this spectacular display. — David Goudy ☐

The MISSOURI BOTANICAL GARDEN BULLETIN is published 10 issues per year monthly except January and August, by the Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Mo. 63110. Second class postage paid at St. Louis, Mo.

Lorine H. Compton, Editor

SUBSCRIPTION RATES:
$5.00 per year. $6.00 foreign.

JOHN ELSLEY APPOINTED CURATOR OF HARDY PLANTS

John E. Elsley of Essex, England, appointed Curator of Hardy Plants at the Missouri Botanical Garden arrived in St. Louis in August. Mr. Elsley, a former gardener at Kew Gardens and most recently Botanist to the Royal Horticultural Society, will be responsible for assembling a comprehensive collection of plants which can be successfully grown out-of-doors in the St. Louis area.

Mr. Elsley is especially conscious of the extremes of the St. Louis climate as compared with England's. He admits that, when he stepped from his London flight at the St. Louis airport in mid-August he momentarily believed he was standing in the path of a jet exhaust. "The summer heat here *is* formidable," he says, "and it might seem to the average U.S. gardener that the dampness and eveness of the English climate would make it infinitely more receptive to a greater variety of plants. I am, however, convinced, that a much wider range of plants than many imagine will thrive out-of-doors in Missouri's more eccentric climate. My first plan at the Garden, having once got to know it well, will be to try to increase the range of hardy plants growing here. I intend traveling around the U.S. to arboretums and nurseries to determine just what is available to us. And we shall ourselves be raising new plants from cuttings and seeds from other countries. Visitors here need examples of what can be grown with success in and around St. Louis and, I hope, our Garden will be able more and more to demonstrate the possibilities."

The new curator, whose enthusiasm for his work here is at once obvious and contagious, strikes one as being very much in the tradition of his fellow countrymen and Garden predecessors. There has been, since the very beginning of Shaw's Garden in 1855, an important and lasting bond with the Royal Botanic Gardens at Kew. In a letter dated August 10, 1857, Sir William J. Hooker, then director of Kew Gardens, advised Shaw, "Very few appendages to a garden of this kind are of more importance than a library and museum and these gradually increase like a rolling snow ball." In 1866, Mr. Shaw was fortunate in securing the services of Mr. James Gurney from Kew Gardens, who, with Shaw, planned and supervised the planting of the Missouri Botanical Garden and Tower Grove Park. And, in 1906, George Pring, a graduate of the Queen's School of the Royal Botanic Gardens at Kew came to the Garden as foreman in the orchid and exotic department. He was made Superintendent of the Garden in 1920, a post he held until his retirement in 1962.

John Elsley's first visit to the Garden took place last winter. He was, he says, immediately impressed by the great scope of the Garden's educational, scientific and aesthetic functions, a triple emphasis to which he felt his own qualifications both as a horticulturist and a botanist particularly suited. Mr. Elsley's interest in plants was an early one. He graduated from the Friends' School, Saffron Walden in Essex with "A" levels in botany, zoology and geography. Many British boys with three "A" levels go straight on to a university. Mr. Elsley chose practical experience first, and went to work at the Royal Botanic Gardens at Kew. A year later he entered the Essex Institute of Agriculture and, after receiving his certificate, returned to Kew as a student gardener. After three more years at the Gardens, he entered the University of Leicester from which he graduated in 1968 with a B.Sc. (Honors) in Botany.

"I went at it backwards," says Mr. Elsley, "but when one enters university at 25, he knows very well just what he means to get out of it." From 1969 until July of this year, he has held the position of Botanist to the Royal Horticultural Society, one of the most important societies of its kind with a worldwide membership of around 65,000. At the Society's Garden at Wisley, and previously at Kew, he worked with two of the largest living collections of Old World plant material. Other involvements with the Royal Horticultural Society were participation in their 15-odd London Flower shows (the best known of which is the Chelsa Flower Show held each May), and acting as Secretary to their world famous Orchid Committee. He has, in connection with his work and with his studies, traveled widely in Europe and Northern Africa. Summer expeditions for the purpose of collecting specimens for various herbaria have taken him from East Greenland to the Central Atlas Mountains of Morocco. He has a special interest in arctic flora which he has studied in Iceland, Norway, Sweden,

continued to page 5, column 2

Gardening in St. Louis

OCTOBER GARDENING

Lawn areas seeded or redone last month need careful attention to see that they get sufficient moisture if nature does not supply it. Mow at regular heights and as often as needed so as to build up good turf. A light application of 6-12-12 can be applied early in the month to stimulate good growth.

New evergreen trees and shrubs are best planted in October. Select good quality stock, prepare the planting areas well by incorporating plenty of organic matter in the holes and again in the medium around the plants. Water in well and, if possible, apply mulch around the plants to protect moisture and control the soil temperature.

Fall bulbs for spring color should be planted this month — daffodils early in the month and tulips late in October. It is best to plant when weather and soil are suitable rather than waiting until later. Work in bonemeal (three to four pounds per 1000 square feet) wherever possible, prior to planting. However, if bulbs cannot be planted until later (late November on) prepare soil now, then cover with plastic and mulch over this to keep cold out. Do not hold bulbs over until spring for planting as they will dry out by then and be useless.

Lilies (Lilium) are best secured this month and need to be planted immediately. Select varieties for diversity of color and for different seasons of flowering. Lilies are ideal subjects for semi-shaded areas.

The hobby greenhouse will now fill up rapidly. Watch the temperature and ventilate carefully to control rapid rises or falls in temperature. Watch and control insects before they become widespread. Do not crowd plants as this allows insects to spread. If shading was used earlier in the season, it should be completely removed by the third week in October. Prepare soil mixes for later use and store in areas where they can be easily secured when needed.

House plants should now be brought indoors, but take care to see that they are thoroughly cleaned up so no insects or disease are brought in. They will benefit by receiving occasional baths or syringing to add humidity and keep their leaves clean. Ferns and other moisture loving plants benefit by placing plants on raised containers over trays of water. Ease up on feeding now that the days are shortening.

All roots and bulbs requiring winter storage, such as gladiolus, tuberoses, tuberous rooted begonias, caladiums and cannas, need to be taken in when frost has cut the tops down.

Roses need to have bonemeal worked around them (1 cup per plant) late in October, prior to healing up for winter protection. Little or no pruning is required on roses in the fall; in fact it is felt they overwinter better if not pruned in late fall.

A few parsley and other special herbs may be dug up to carry over in the greenhouse or the kitchen window for winter garnishes. □

A NEW LOOK FOR THE 1973 CHRYSANTHEMUM SHOW

For 76 years St. Louisans have looked forward to the fall Chrysanthemum Show, the oldest and largest of the four annual flower shows at the Missouri Botanical Garden. Visitors to the 1973 Show will be rewarded by an entirely new dimension — an exhibit of the beauty and variety of the chrysanthemum in settings specially designed to demonstrate just exactly how it can be grown to full advantage in local private gardens.

As in past years, the Chrysanthemum Show will be held in the Garden's Floral Display House. On entering the building's long display hall, the visitor will come first upon the facades of two typical St. Louis houses. In front of the first house will be a summer garden complete with lawn, trees, a flagstone path, flowering borders of geraniums, marigolds, and blooming perennials. The second will show, with a few minor changes, how the same garden might appear in fall. The fall garden will feature the use of many varieties of chrysanthemums hardy to the St. Louis area planted in borders, against foundation boxwoods, and cascading from window boxes. The emphasis in both the summer and the fall garden will be on simplicity and low maintenance. Facing the facades across the hall will be a third garden, this one planted to give viewers numerous ideas about yard landscaping and an effective arrangement of lawns, trees and shrubs.

A large section of the back of the hall will be reserved for the Ladue Garden Club which will present yet another aspect of chrysanthemum use. Here the Club will construct a two-part exhibit consisting of an interior setting, fully furnished with antiques lent by members and decorated with arrangements of cut chrysanthemums. This room will include a bay window overlooking a patio to be decorated with potted mums and other suitable patio plants.

For a total change of scene the visitor will, by simply turning around, be able to see the many possibilities offered by Orientally influenced landscaping. A Japanese garden, complete with tiny tea house, will fill the back corner of the building. In this garden the staff will demonstrate the effects of raked ebbles and extremely simple plantings of maple and uniper trees, with spider mums as the delicate final ouch.

In the center of the hall an enormous low pyramid omprising scores of chrysanthemum varieties will ividly display the infinite beauty and diversity of the lower's colors, sizes and shapes. Eighteen baskets illed with cascading mums will be hung above the yramid in a mobile arrangement. And, finally, there vill be a specially constructed display of the famous ndianapolis chrysanthemum, perhaps better known o most as the "Football Mum."

Altogether, the 1973 Show will have on display orty-two varieties of the chrysanthemum in exhibits hat should send visitors home with a great many oractical ideas on their accessibility and their very great decorative possibilities.

Although the chrysanthemum has become a flower raditionally associated with Thanksgiving, it was in fact unknown in American until the late 19th centu- y. The first plant was brought to the U.S. from France well over 200 years after the Pilgrims' first celebration and nearly 100 years after George Washington declared an official day of Thanksgiving in 1789. The first of the annual Chrysanthemum Shows at the Missouri Botanical Garden was held in 1893, a remarkably short time after that initial introduction of the flower to this country. Obviously, the early stagers of the Show recognized the potential oopularity of the 'mum' in America and it is fitting that this 76th Show should take for its new direction one that will ensure the chrysanthemum an even greater use and success in St. Louis homes and gardens.

The Chrysanthemum Show will be on display October 27th through November 12th. Members of the Garden will preview the show at a party October 26, sponsored by Jaccards Jewelers.

Clumps of chrysanthemums in bud or flower may be dug and potted for home or porch decorations.

To get the longest life from a potted chrysanthemum, place it near a bright window and keep it moist at all times. Night temperatures around 60 to 65 degrees are ideal. A windowsill will usually have slightly cooler temperatures than in the rest of the room. If a windowsill location is not possible, move the plant to a cool room at night.

Most of the chrysanthemum varieties that are forced for potted plants do not make good outdoor plants. They flower too late in the fall, and, therefore, the flowers are killed by frost just as they develop. Some potted varieties are not reliably hardy.

Hardy outdoor chrysanthemums are one of the most spectacular garden plants available. They are extremely easy to grow and are well adapted to many conditions and soil types. They should be given full sun and well drained soil. Many people find them well suited to the south side of the house because they are less subject to damage from early fall frosts.

At this time of year we should plan winter protection for the mums in the garden. The term "hardy chrysanthemum" has led many to feel that they are completely hardy. Unfortunately most varieties are not completely hardy, and may be killed during a severe winter. For this reason mums must be protected. Mums benefit from a deep snow cover and soil that remains constantly frozen all winter. In our area we do not have a constant snow cover, and soil freezes and thaws frequently in late winter which often kills mums already weakened by exposure.

For best overwintering, mums must have excellent drainage. If they are in an area that remains moist, or where water collects even for short periods, they should be moved now. After the soil has frozen, cover the mums with a loose mulch. Since mums produce small new shoots in the fall, care must be taken that these little shoots are not smothered by a tight mulch.

Materials such as evergreen branches, coarse hay, twiggy shrubs, or corn stalks are suitable mulches. Do not use peat, leaves, sawdust, or straw, on top of mums. Varieties known to be tender should be dug up and overwintered in a coldframe. □

ELSLEY *(continued from page 3)*

and Finland. His scientific articles have appeared in a number of leading horticultural journals.

John Elsley's recreational interests are varied — soccer, track, horseracing, and the collection of old English ceramics, particularly lustreware. Not surprisingly, his hobbies also include photography and the history of gardening. Before departing England, he visited and photographed some of Henry Shaw's British haunts, among them the Mill Hill School near London and the Duke of Devonshire's estate at Chatsworth. The gardens at Chatsworth have traditionally been cited as an inspiration of Shaw's earliest horticultural passion. Mr. Elsley feels that Shaw's stay at the Mill Hill School must also have made a very early and lasting impression. The school was at that time housed on the estate of Peter Collinson, the distinguished 18th century botanist who had such close connections with American botany.

The Missouri Botanical Garden welcomes John Elsley and extends to him all good wishes for a long and happy stay in St. Louis. □

Flowers of *Fothergilla,* growing on west side of lake at the Missouri Botanical Garden.

IMPORTANT ADDITION TO THE GARDEN'S LIBRARY

A Gift from Mrs. Fothergill Graves

What possible connection can there be between the Missouri Botanical Garden, Captain Cook's last voyage, the *Fothergilla,* and an eighteenth century English physician who championed the cause of the American colonists during the Revolutionary War? The answer to this riddle lies in a fragile folio volume recently presented to the Garden's library by Mrs. Fothergill Graves of St. Louis.

Tracing the origin and history of this volume has involved a great deal of detective work on the part of the library staff. When received, this book contained two large maps and sixty-one steel engravings outlining the route of Captain James Cook's last voyage to the Pacific, and illustrating many of the animals, plants, people, and cultures encountered during his explorations. No title page accompanied this volume, but inquiries have led us to believe that our library's volume is probably the first edition of James Cook's and James King's *A voyage to the Pacific Ocean . . . ,* published in London in 1784.

According to information provided by Mrs. Graves, at least part of the cost of publishing this work was assumed by one of her ancestors, Dr. John Fothergill. Dr. Fothergill was a prominent London physician who numbered among his friends Benjamin Franklin and John Bartram, the Philadelphia botanist. During the American Revolution, Dr. Fothergill was an unswerving supporter of the colonial cause. Like so many medical professionals of his time, Dr. Fothergill's chief avocation was botany, and it was in his garden that many plants native to North America were first introduced into Europe. It was because of his work with American plants that Linneaus named the butterfly bush after Dr. Fothergill.

The unusual history of this folio, the beauty of its engraved plates, and its association with an important figure in botanical history combine to make this gift an important addition to our library's collection. The volume is presently being cleaned and rebound as part of the folio restoration grant recently awarded the library by the National Endowment for the Arts. ☐

TRAINING PROGRAM FOR NEW GUIDES

Gentlemen and ladies with leisure, if you

1. have a strong voice, and can talk to groups of children or adults,
2. have a background in gardening or in botany, conservation, or teaching,
3. are able to walk several miles, sometimes in the rain or cold wind,

you may want to apply for the course for New Guides which will be given next January, February, and March. The course consists of lectures and tours by members of the Garden's staff, every Tuesday morning from 9:30 a.m. until noon, for ten sessions. A written examination is given at the end of the training course.

Graduates are expected to conduct two tours on a given day of the week which they may specify. In addition, Guides attend a monthly Guide-Training program, the second Tuesday of each month from 9:30 a.m. until noon, through the school year.

Guiding is fascinating! It is fun! If you wish to apply, please call the Community Services Office, 865-0440, and leave your name and telephone number. The New-Guide Training Chairman, Mrs. Charles Ruprecht, or Co-Chairman, Mrs. Edward Cissel, will call you to schedule and interview.

Remember the Garden Gate Shop

gifts - books

SAVE November 1

5 p.m. - 8 p.m.

Preview Reception

"A RED AND WHITE CHRISTMAS"

Refreshments

JUNIOR LEAGUE OF

MRS. WILLIAM A. SIMS, JR. RECEIVES AWARD FOR OUTSTANDING VOLUNTEER SERVICE

Mrs. William A. Sims, Jr., Chairman of the Garden Gate Shop Committee, and an active member of the Garden for many years, was selected as "Volunteer of the Month" by the Voluntary Action Center.

The award certificate was presented by William E. Rench, Chairman of the Center, who said "Her years of dedicated service have had a positive impact on the citizens of the metropolitan St. Louis community." In addition to volunteering at the Garden, she has worked in the human-care field, and particularly in the area of education.

Congratulations, Betty, and sincerest thanks. □

THE DISTINGUISHED VISITORS TO THE GARDEN SHOWN ON PAGE ONE INCLUDE

ROW 1

Dr. L.A.S. Johnson, Director, National Herbarium and Royal Botanic Gardens, Sydney, Australia, and Dr. Barbara G. Briggs, Curator of the National Herbarium of New South Wales. Professor David H. Valetine, Professor of Botany, University of Manchester.

ROW 2

Dr. E. Esfandiari, Director, Plant Pest and Diseases Research Institute, Ewin, Tehran. Mr. J.F.M. Cannon, Deputy Keeper, Botany Department, British Museum (Natural History), London. Dr. M.R.D. Seaward, a bryolist, from Leeds, Yorkshire, England. (photo by W. David Stewart)

ROW 3

Dr. Erich Godley, Director, Botany Division, Department of Scientific and Industrial Research, Christchurch, New Zealand. A group of air pollution and meterological researchers from the U.S.S.R., in St. Louis on a scientific exchange program. □

RONALD ARNATTT CHORALE AND ORCHESTRA AT MISSOURI BOTANICAL GARDEN, SUNDAY, OCTOBER 14th

The Missouri Botanical Garden is pleased to announce that the Ronald Arnatt Chorale and Orchestra, under the direction of Ronald Arnatt, will present a program of "Flower Music" in the Garden's Floral Display House on Sunday, October 14th at 8:00 P.M.

The evening will include pieces by Britten, Milhaud, Honegger, Villa-Lobos, Walton and Arnatt, and will feature "A Garland for the Queen" written for the coronation of Elizabeth II and sung in honor of the 20th year of her reign. Carolee Coombs-Stacy will be soprano soloist.

Admission is $3.00, $1.50 for students.

The Ronald Arnatt Chorale, a civic chorus of semi-professional singers, is an outgrowth of the St. Louis Chamber Chorus organized in 1956 by Dr. Arnatt to present unusual, rarely performed masterworks in the choral literature. This Chorus was augmented in 1959 by the St. Louis Chamber Orchestra and together they have presented to St. Louis audiences 17 seasons of exquisitely performed concerts.

In the fall of 1971, the official name of the Ronald Arnatt Chorale was acquired partly because of the nature of larger works being performed by the group and also because of the growing reknown of the conductor. Mr. Arnatt, in that year, had received honors which included an honorary doctorate in music from Westminster Choir College, Princeton, New Jersey and, most significantly, appointment as organist of the St. Louis Symphony Orchestra. This led to an even greater collaboration with the St. Louis Symphony and in 1972 the Symphony presented, with the Chorale and the University Choruses, Vaughan Williams' "Sea Symphony" at a premiere performance in St. Louis and at the Kennedy Center for the Performing Arts in Washington, D.C.

The musical director and conductor, Dr. Ronald Arnatt, was born in London in 1930. He attended the Westminster Abbey Choir School, King's College Choir School, Cambridge, Trent College, Trinity College of Music in London and Durham University, receiving a bachelor of music degree there in 1954. He came to the United States in 1947 and to St. Louis in 1954 when he was appointed Organist and Choirmaster at Christ Church Cathedral and Director of Music at Mary Institute. He conducted the Kirkwood Symphony from 1964-68 and has appeared as guest conductor for the Belleville and Alton Symphony Orchestras. He has toured the U.S. and England frequently as concert organist performing in recitals at Westminster Abbey, the BBC, National Cathedral in Washington, D.C. and other cathedrals across the country.

THE GARDEN WELCOMES THE FOLLOWING NEW MEMBERS

INDIVIDUAL MEMBERS

Mrs. Mary Beth Abbott
Larry Anschutz
Leola Bishop
Mrs. Nathan Blackman
Mr. C. Allen Boedeker
Mrs. Frank A. Bowman
Mrs. Nedra Branz
Ruth C. Chambers
Ms. Elizabeth Clayton
Dr. Barbara R. Cole
Mrs. Francis W. Dennis
Mrs. Patrick J. Dowd
Mr. James A. Francis
Miss Agnes Fuerbringer
Mrs. Colleen Gass
Miss Mary R. Gillette
Miss Helen V. Guenthel
Mrs. Volney O. Hildreth
Mrs. N.T. Holmes
Mr. George D. Jost
Mrs. Stephen R. Kinsella, Jr.
Ms. Lynn Krueger
Mrs. J. Paul Ohrman
Miss Olivia J. Ruether
Mr. Donald J. Schmittzehe
Ms. Kanoi Sosna
James Steffen
Ms. M.V. Telson
Mrs. Minnie E. Tomlin
Miss Sue Vesper
Mrs. Fred L. Walker
Mr. and Mrs. Donald Wisdom

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Mr. Rex Bronsing
Mr. & Mrs. Ralph Bungdorf & Family
Mr. & Mrs. Joseph Cohn & Family
Mr. & Mrs. John Cunningham
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Mr. & Mrs. James E. Brands

INCREASE IN MEMBERSHIP CONTRIBUTIONS

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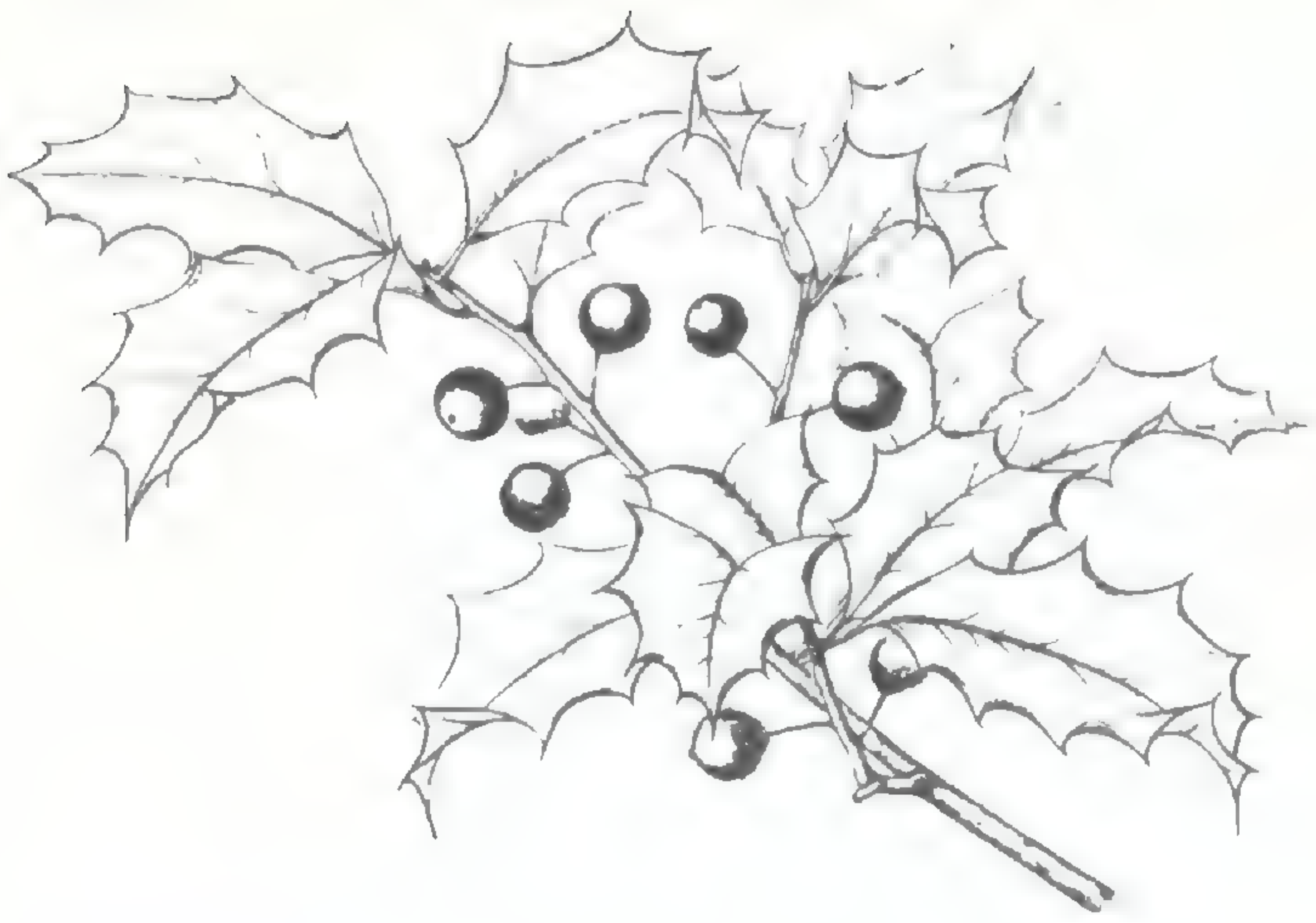

CHRISTMAS IS COMING

At The Garden Gate Shop

Christmas came on the first of November. All through this month and next, members and friends will find a large selection of pleasant surprises. There are holiday placemats and tableware to make November and December mealtimes more colorful. Unusual stocking stuffers for anyone from six months to sixty years have been laid in with an eye toward sheer entertainment and intellectual stimulation. And, the newest seasonal cards, notes and wrappings make wishing gay greetings a real pleasure!

And what about a little early gift for yourself? Imported and handmade ornaments to hang on your tree, in your window or around your neck on a chain will make your 1973 Christmas just a little different from any other year.

Now that nearly half of the Garden Gate Shop has been devoted to books, shoppers with students, cooks, gardeners, environmentalists or armchair travellers on their lists can find many of the newest selections available for perusal and purchase. Ruth Gruner, the Shop's manager, will be happy to order any which are not in stock.

For the party hostess, the Shop is showing the latest in handmade full length aprons — some pinafore style, some on a straight jumper design. Oversize oven mitts — the kind no one can ever find when the barbeque season is over — make excellent presents for men and women alike.

One of the most delightful gift ideas for Christmas — or any other time — is a lamp, and the selection offered by the Garden Gate Shop is as wide as it is beautiful. The ceramic vase table style with birds and/or flowers reproductions lend themselves nicely to desks, accent tables, or — in pairs — as reading lamps.

For the gourmet cook, fancy casseroles, soup tureens, an exquisite selection of spices and herbs, all can complement her (his) kitchen.

For the ladies on your mind (young or mature), there is a selection of costume jewelry unlike any you will find in the local stores or boutiques. Although jewelry is a constant item with the Gate Shop, holiday time has prompted the stocking of some rather lovely pieces for special wear.

Now that winter is nearly upon us, avid gardners will want cachepots to cradle their clay pots. Come to the Garden Gate Shop! Where else would you expect to find such a wide variety of sizes and shapes?

And if your flower lover is a specialist, there are all sorts of shears, gadgets, arranging gimmicks and tricks which can turn a novice into a master in short order.

Whatever you need for whomever you love — you'll find it in the Garden Gate Shop! Come in and celebrate Christmas with us.

The **Holiday Flower Show** will open this year on December 8 with the annual **Children's Christmas Party**. Santa Claus will be joined by a Christmas circus troup to entertain members' children of all ages.

The flower show itself will feature the traditional live Christmas plants as they can be used in home decorating, both inside and out.

The exhibit, in the Floral Display House, will continue through January 13, 1973.

The staff of **Tower Grove House** invites you to share a nostalgic moment when the house dons its traditional Victorian Christmas charm. The house, to be decorated with its unique ornaments and greens on the third weekend in December, is open from 10 until 4 daily except December 25.

Volume LXII Number 9

November, 1973

JOHN R. DIXON APPOINTED NEW CHAIRMAN OF EDUCATION

Dr. Peter Raven, Director and Dr. William Klein, Assistant Director, have announced the appointment of Dr. John R. Dixon, as Chairman of the Missouri Botanical Garden's Department of Education. Born in West Frankfort, Illinois in 1941, Dr. Dixon was reared and received his early education in Benton, Illinois where he majored in Botany (B.S. 1963) and Angiosperm Taxonomy (M.S. 1965) under the tutelage of Dr. Robert H. Mohlenbrock. His doctoral degree was conferred (1972) by the Department of Plant Pathology and the Graduate School of Cornell University, Ithaca, New York where he studied under the guidance of Dr. Richard P. Korf, Professor of Mycology and Plant Pathology. The topic of Dr. Dixon's dissertation was a biosystematic and monographic treatment of three genera of cup-fungi *(Inoperculate Discomycetes Ascomycetes)* and the elucidation of taxonomic relationships within this group of plants continues to be of major research interest to him.

From 1965-1968, Dr. Dixon was appointed to the position of Lecturer of botany and biology at Western Connecticut State College in Danbury, Connecticut. During this appointment, he was responsible for courses in botany and biology, the establishment and curatorship of the College's small herbarium, and supervision of the College's tropical conservatory and teaching greenhouse. He was also active in curriculum development and the planning of a new addition to the College's science building.

In 1972, Dr. Dixon was appointed to the faculty of Ohio University as a Visiting Assistant Professor of Mycology in the Department of Botany where his teaching responsibilities covered advanced graduate courses in Mycology and Ascomycetology. His research and teaching interest have taken him to Puerto Rico, Jamacia, St. Thomas, Dominica, St. Croix, England, Canada, and throughout the Eastern, Southeastern, and Midwestern United States. He is a member of the Society of Sigma Xi, Phi Kappa Phi, Gamma Alpha Scientific Society-Cornell Chapter, Mycological Society of America, National Society of Plant Taxonomists, Canadian Botanical Society, National Association of Biology Teachers, Biology Association for Teachers, The Adult Education Council of Greater St. Louis, and is a member of the Board of Trustees of the Garden Tower East Community Cooperation (a St. Louis Urban Renewal Cooperation).

Dr. Dixon has had a long standing interest in the educational institutions in the U.S. and the educational philosophies which guide and direct these institutions. He is strongly committed to the idea that education and learning are exciting and offer the possibility of a myriad of enriching experiences. That they should be an onward going process that opens wide the doors of past and future minds, provides the individuals involved with a high degree of self-discipline, a basic and flexible philosophy of living, an increased awareness for life, and heightens the individual's ability to analyze and extrapolate from a basic set of facts and principles.

In relation to his position at the Garden Dr. Dixon states: "I think the Garden, and other institutions like ours, are in a unique position to provide educational programs and opportunities that are not possible in a more formalized classroom situation which are often hampered by time and facilities. The Missouri Botanical Garden has one of the finest collections of plants in the world and is in a unique position to offer experiences and activities not possible under the conditions I just mentioned. Also, individuals who participate in the myriad of educational opportunities at the Garden do so for their own edification. They are not placed under the psychological strain of grades or trying to complete degree requirements and hence, their willingness to immerse 'body and soul' into the learning process is paramount. I strongly feel that in every aspect of the Garden's educational programs we should endeavor to complement and augment the experiences children and adults receive in the more traditional classroom. We are unique, hence our offerings should be unique and should not be of the types one can obtain in other educational programs in the St. Louis area. I feel we must guard against duplication which in my estimation results in inefficient use of both staff time and our financial resources. We have the facilities and with the aid both in time and financial support of the St. Louisans who recognize the important contributions the Garden makes to the community at large and who have in the past supported the Garden's various activities (and I feel certain will continue to do so in the future on the same basis) we cannot fail to accomplish our common goal to make the Missouri Botanical Garden the finest of its kind in every facet of its endeavors in the country.

"The Garden has for many years presented courses, workshops, lecture series etc. aimed at fostering knowledge in the plant sciences and the vital role that plants play in the web of living things. For instance, the Garden offers courses and workshops on practical horticulture and botany to area school children and adults during the day and on some evenings, and on Saturday mornings provides a long list of programs for children. We are hoping to increase our activities

not only in these kinds of activities but in presenting more teacher workshops designed to further the teachers confidence and competence in presenting units about plants in his or her own classes.

"In regard to programs designed and aimed specifically at adult education, we are hopeful that within the near future we can with the addition of new staff members and a more efficient utilization of our present staff present courses dealing with not only the basic aspects of horticulture, floriculture, and botany, but present a series of courses embodying more advanced aspects of these fields. Again, I should reiterate that these courses will not embody information of the nature presented in college, university, or extension courses, but would be designed in a manner that would augment such presently available courses within the St. Louis metropolitan area.

"We have recently become involved with one of the County Schools, on a pilot project basis (the Mason-Ridge Elementary School — Parkway School District) in presenting a unit entitled 'Adventures in Gardening' in conjunction with their already outstanding After School Enrichment Program. (This program was initiated and is conducted by parents with the officials' blessing and encouragement.) Our objective in this unit is not only to impart added information concerning plants, which is not possible in the normal school curriculum due to the time factor, but also to present experiential activities that bring to its fullest fruition the innate enthusiasm these children have about plants and gardening, with hopes that they will be stimulated to strive to their fullest capacities over the span of their life times to pursue added information in these areas.

"In relation to my comment of support, may I say the following: Even though I have been privileged to be a part of the Garden's staff for only a very brief time, I have never experienced or heard of any volunteer program that is as extensive and in which its participants are as enthusiastic as the one here at the Missouri Botanical Garden. *It is truly exceptional!* In relation to this comment, I have been formulating the idea that I would like to see volunteer involvement in our educational help engaged in working with children can and will heighten the children's enthusiasm, interest and curiosity about plants and the plant sciences and bring to fruition an added dimension to our programs and future society. Such a program should also impart an intrinsic sense of accomplishment and pride in those individuals who participate. I am convinced that the appropriate time to begin environmental awareness is before behavioral and thought patterns are firmly established and through such a volunteer program we can in the very realist of realities benefit our society and attack our environmental plight. I should be more than happy to proceed with such a volunteer program and can only hope we can elicit the support of any and all St. Louisans who are capable of contributing time and effort to such a program.

"In closing may I say, that I feel the Missouri Botanical Garden is on the threshold of a new and exciting era and I am extremely pleased that I shall have the opportunity to be a small part of one of the most prestigious and honored institutions in St. Louis." □

CORRECTION: The photograph labeled "Flowers of *Fothergilla" in the October* BULLETIN was inadvertently replaced by a photograph of *Cephalanthus.*

The MISSOURI BOTANICAL GARDEN BULLETIN is published 10 issues per year monthly except January and August, by the Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Mo. 63110. Second class postage paid at St. Louis, Mo.

Jane S. Heitman, Editor

SUBSCRIPTION RATES:
$5.00 per year. $6.00 foreign.

BAL ORIENTALE

On the evening of September 21, 900 guests attended the gala, a benefit for the creation of a Japanese Garden. Honored Guest was Mr. Tateo Suzuki, Consul General of Japan at Chicago, who had come to St. Louis especially for the benefit. The design for the new Garden is a gift to the people of St. Louis from the Japanese American Citizens League.

Cocktails were served around the lily pools, Dinner, on the lawn east of the Lehmann Building, the party reflected in the mirrored glass walls of the building. Entertainment included the Bernard Ho Dance Troup from Hong Kong and the Chung Ngai Dance Troupe from San Francisco. After dinner, guests danced to the music of Russ David and his orchestra.

The Bal, co-sponsored by Stix, Baer and Fuller, provided funds for the beginnings of the Japanese Garden, which is to be developed in several stages, over a period of years.

Gardening in St. Louis

NOVEMBER

Fall's blaze of color is dying out, and gardening for November consists mainly of chores that are not immediately rewarding, but necessary for winterizing the garden and laying some of the ground work for spring.

Shrubs, trees and **evergreens** can still be planted as long as the ground is workable. Mulch newly planted specimens well with several inches of wood chips, compost or leaves to protect the ground from heavy frost. These plants will continue to make root growth as long as the soil is not frozen. Water heavily as needed.

Spring flowering bulbs can still be planted now, but further delay will mean poor results next spring.

Roses overwinter better if not cut back too severely, according to reports from various areas about the country. Incorporate 1 cup of bonemeal around each plant and mound soil or compost around each rose for protection once heavy frosts are here to stay.

Continue to cut the **lawn** as long as it is growing, to prevent the grass from becoming too long and matting, as this causes disease.

Plenty of material is available in the form of leaves and other debris from the garden to add to the **compost pile.** The clippings from evergreens and shrubs should be chopped up in small pieces before adding these to the compost pile, as they are very slow to deteriorate.

All **annuals** should be cleaned up and beds dug and left rough for the winter. Add compost now if you have it and, if possible, plant spring bulbs for added color in these beds.

Late summer flowering shrubs should be pruned now if this has not already been done. Holly and evergreen may be left to the holiday period for trimming and shaping, at which time the trimmings are used for indoor decorations.

Garden tools should now be cleaned, sharpened and oiled before their winter rest so that they are ready for spring use. Shops are not busy now, so repairs to mowers and other equipment should be scheduled.

Bird feeders should now have a constant supply of feed for the winter birds.

This is a good time to review the work of the season and bring your **garden notebook** up to date. Jot down ideas for next spring, with plans to add one or several new plants to the garden that you have not grown. Plan to read at least one new garden book this winter. The Garden Gate Shop has several new ones.

Questions are often asked as to how often to feed **houseplants.** This depends largely on the type of plant being grown. Plants in flower should receive regular feedings weekly, then reduce once flowers stop. If plant is growing actively, feed once in every 3 weeks; otherwise withhold feeding until new growth commences. Watering is also important – Avoid too much water as growth slows down. Run plants on the drier side, but don't let them wilt. Watch for insects and spray as needed to control them.

The **home greenhouse** should be fully functioning now and temperatures and watering need careful consideration. Avoid overwatering and direct drafts. Seeds of many plants can be started now for early spring bloom indoors. Procure winter flowering bulbs for added color. □

65,000 SPRING BULBS PLANTED

This month and next, 65,000 spring bulbs will be planted throughout the grounds of the Garden. Varieties of tulip, daffodil, narcissus, scilla, grape hyacinth, allium and anemone are being set out in front of the Climatron, throughout the knolls, along the base of the Lehmann Building, and naturally throughout the grounds.

The planting is an effort to update the selection of spring flowers in the Garden and increase the early spring display. Over seventy varieties of narcissi and daffodils alone are included in the new selection. Blooming schedule for all of the new spring plants will range from early March through mid May.

Also this month, eight hundred lilies will be massed in the knolls for a splash of brilliant color from early spring into late May. □

TOWER GROVE HOUSE APPOINTS NEW CHAIRMAN

Mrs. Charles S. Lamy has been appointed Chairman of the Historical Committee, succeeding Mrs. W. Warren Kirkbride who has served for the past four years. Other members of the Committee are: Dr. Peter Raven, Mrs. William G. Bowman, Mr. George R. Brooks, Mrs. Jerome F. Kircher, Mrs. W. Warren Kirkbride, Mrs. John S. Lehmann, Mrs. C.C. Johnson Spink, Mrs. Neal S. Wood, Mrs. E. Nulsen Young, and Honorary Member Mrs. Roland Jesten. □

NATIONAL SCIENCE FOUNDATION FUNDS TWO GRANTS

The National Science Foundation has announced the award of a two year research grant of $27,000 to the Missouri Botanical Garden. The grant is to support Dr. Al Gentry's systematic and ecological studies of the trumpet vine plant family *(Bignoniaceae)* in South America. Most of the award will be used to finance field work designed to make observations and collections of these and other plants which grow in the rapidly disappearing and poorly known rain forests of South America.

The race to understand and catalog the incredible biological diversity of the world's tropical regions before they are destroyed is becoming ever more critical. The collections and observations made by Dr. Gentry will be studied and analyzed in the herbarium at the Missouri Botanical Garden and will help provide a permanent record of the species of the tropical rain forest. Many tropical plant species are as yet undescribed, and hence unknown to science. One of the goals of Gentry's botanical exploration is to complete an inventory of the plant species of the world's most complex ecosystem before it is totally destroyed.

"It is quite reasonable", said Gentry," to expect to find species of many unknown tropical plants with important medical applications as well as missing links of importance in interpreting evolutionary relationships among plants.

"Our study of botanical dependence in the tropics is equally important now because if the countries involved stop their destruction of the rain forests at some future date, it will be necessary to reconstruct them (much as prairies are now reconstructed in the United States) to conserve their natural resources."

Dr. Gentry will leave in early January for Colombia, Equador and Venezuela.

More recently, an NSF grant of $25,000 was received by the Garden to underwrite Gerrit Davidse's studies of grasses.

"As a group," said Davidse, "grasses are without a doubt the most important plants to man in his daily life. The large majority of his food comes either directly or indirectly from grasses. Civilizations through the ages have been directly based upon the cultivation of at least one grain. In the less developed cultures, especially in the tropical areas of the world, the list of grasses that serve as direct food plants can be much extended. And, there are innumerable other ways in which man utilizes grasses: ornamentals, construction and furniture, erosion control, perfume, fibre for paper making, and musical instruments.

"The number of species in the grass family is estimated to be near 10,000, making it not only the largest family of plants in number of individuals, but also one of the largest in number of species."

Davidse's funds have been granted specifically for the study of the genus *Trachypogon* whose species are an important component of the savannas of Africa and Latin America. Much confusion exists about the number of *Trachypogon* species known, and it is at that basic level of providing taxonomic classification that Davidse's initial study will be directed. Further hybridization and cytogenetic studies will be made to determine genetic relationships and possible evolutionary histories of the grasses.

Dr. Davidse plans to depart for Venezuela and Columbia in November, working in and around the area until January, 1974 when he will go on to Kenya, South Africa and Nigeria for further study. ☐

HAPPY HOLIDAY YEAR 'ROUND

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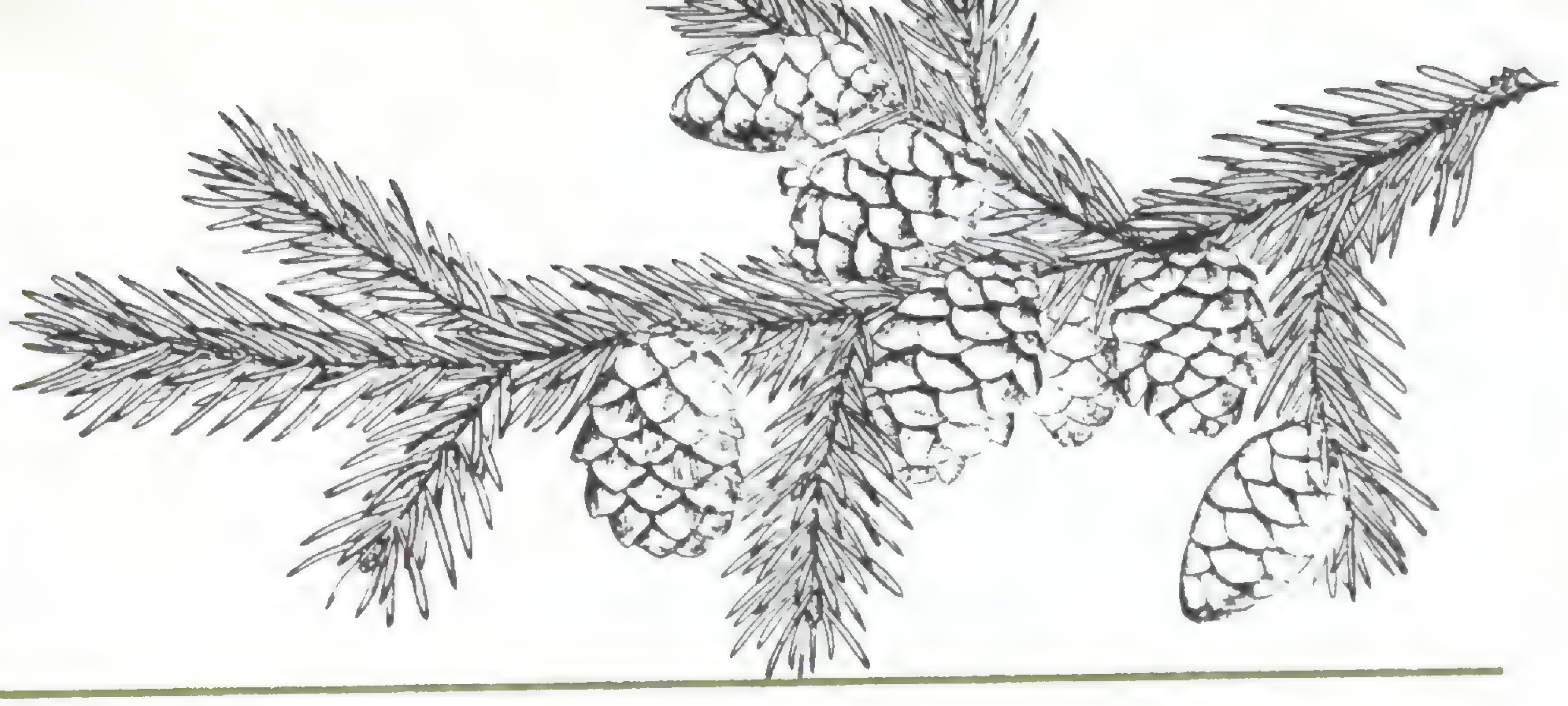


From the Director

1973, the 115th year in the history of the Missouri Botanical Garden, was an exciting one as the Garden became more diversified in each of its major roles — beauty, education, and research.

The collection of plantings on the grounds was expanded as new varieties of plants which are favorites of St. Louisans, as well as plants new to St. Louis, were introduced. Thousands of bulbs filled the Garden with color from one end to the other during spring, and in summer vibrant annuals bloomed in the Knolls and around the lily pools. New plantings of papyrus and other water plants joined the tropical water lilies in the pools by the Climatron, and the Scented Garden for the Blind, in its second year, had mature plants. The area to the west of the Climatron was landscaped, and the exterior of the Desert House was painted in tones chosen to blend with and add to the natural beauty of the Garden. Construction of the A. Wessel Shapleigh Memorial Fountain was begun.

New varieties of camellias, rhododenrons, and primulas bloomed in the Linnaean House. In the Climatron pruning, labelling, and the planting of new material continued at an ever quickening pace. The tropical pool was redesigned and heated, and fish were added. Educational displays and art exhibitions, set against the exotic background, were shown in a new perspective.

In the Floral Display House, for half a century the site of annual flower shows, the '73 Chrysanthemum Show had a "new look." The Show featured ideas for landscaping St. Louis homes, displays of the use of chrysanthemums indoors and on patio areas, and, as always, the flower shown en masse — in all colors and sizes.

The Education Department expanded its scope to include teacher workshops, and new classes in natural history and horticulture. The department received funding from the Cooperating School Districts of St. Louis County. Spring and fall gardening workshops were presented by the horticulture department, and at the Arboretum and Nature Reserve in Gray Summit, environmental awareness programs continued throughout the year.

Research programs moved ahead speedily, as the facilities of the John S. Lehmann Building became operational. There, members of the Garden's research staff are currently involved in projects which will provide the basic information necessary to solve the problems facing the next generation: the world's food supply, new sources of medicinal plants, and ways in which our vegetational resources can serve as a guide to land use planning. During the past year the Garden has received grants from the National Science Foundation, the National Geographic Society, the U. S. Department of Agriculture, and other agencies. These grants indicate the importance of the Missouri Botanical Garden as a research institution of international renown.

The Arboretum continues to be developed as a resource center for the study of environmental problems. The staff is developing curricula for training in outdoor education, and an inventory of the natural features is being studied, for use in regional planning.

Attendance increased substantially, and activities for the general public expanded. During the summer "Celebration of Nature" performing groups of many kinds — children's theater, folk-rock groups, symphony orchestras — appeared on the Garden's outdoor stage. The Saint Louis Symphony Orchestra played in the beautiful setting south of the Climatron for the second consecutive year. Special events for the Membership increased also, and a lecture series in Botany began last January.

This is an impressive list of accomplishments — made possible by a dedicated staff and the many people of greater St. Louis, who believe in the Garden and support it, both financially and through volunteer services. It is these people who, for more than a century, have given the Garden to the community.

Volume LXII Number 10

December, 1973

THE GARDEN NEEDS THE SUPPORT OF THE ST. LOUIS COMMUNITY

Receiving no direct tax support, the operation of the Garden depends primarily upon voluntary contributions from the people who wish to perpetuate the 115 year old record of service to the community. We are deeply grateful to our Members, who contribute directly to the Garden, and to the Arts and Education Council of Greater St. Louis, for financial support. These sources provide support for day to day operations; any capital improvements must come from outside sources or special capital fund drives. Our thanks to the people who make these sources of income possible: the Executive Board of the Membership for planning, co-ordinating, and overseeing many programs of the Garden; and to the community leaders and volunteers who work so diligently to make the annual Arts and Education Drive successful.

The year has seen an expanded volunteer program, one in which volunteers worked side-by-side with staff in every department of the Garden.

"Horticulture Helpers" dig and rake and plant outdoors with the grounds crew, wash pots and propagate plants with the greenhouse crew, and serve as hostesses in the Climatron. Extra hands in the education department include the guides, who last year gave tours to 16,000 school children and adults, and the aides in the classrooms, so that our education programs have been made to run more effectively, and greater numbers of students can be served.

In the library and herbarium, working side-by-side with the staff, volunteers have made the services of our fine library and herbarium far more accessible.

The Board of Trustees of the Garden, with our Business Office, guides us in sound business management necessary for an operation as large and diverse as is the Garden today.

Perhaps the most gratifying occurance during 1973 was the development of plans for a Japanese Garden, to be built near the lake area in the southwest section of the Garden. The reality of the Japanese Garden is the culmination of the commitment of a large group of citizens of St. Louis, to have a quiet place of beauty for all to enjoy.

It has long been the desire of the Japanese American Citizens League to have a Japanese Garden for public enjoyment here in the heart of the Midwest. The group engaged in various fund raising activities over a period of years for this purpose. Last spring, the JACL came to me, offering the gift of the design of such a Garden to us. They had retained Mr. Koichi Kawana, a nationally recognized authority on traditional Japanese Gardens.

The Citizens League's effort was enlarged a thousand fold by the *Bal Orientale,* the first benefit ever to be held at the Garden. The purpose of the *Bal* was to raise funds for the initial stages of the garden. What a stir of activity took place through the summer! Committees met to plan food, decorations, entertainment, address thousands of invitations, arrange tables. With the sponsorship of Stix, Baer and Fuller, the *Bal* was an outstanding success, and raised more than $16,000. 900 guests were present on a magical evening — so that there would be "Stones and rocks, small trees, expanses of water — to provide people with a peaceful and tranquil atmosphere, a meeting place for people and nature again."

As Director, I deeply appreciate the efforts that each of you have made for the Garden in the year just past. For a great many of you, your work has been put forth for many years before my coming to St. Louis in 1971. For each of us here today, we have inherited a great tradition, from the mid-19th century, to have, as Henry Shaw's Will specified, a "Botanical Garden easily accessible, for the use of the public."

On the horizon we are looking forward to further physical improvements, expansion of the living collections, added activities for public enjoyment, new and exciting emphasis in the flower shows, and ground breaking for the Japanese Garden.

As I look ahead to the New Year for our Garden, I wish to extend best wishes to each of you for 1974.□

Peter H. Raven

A COLORFUL SPRING WILL COME TO THE GARDEN

During fall, the grounds crew planted 60,000 bulbs — in all sections of the Garden. The first bloom should appear in early March.

THE GARDEN WILL BE OPEN
NEW YEAR'S DAY
GREET 1974 AT THE GARDEN.

COME TO THE GARDEN
FOR THE BEAUTY OF WINTER

Silhouettes of trees,
the crackling of ice
or the crunch of snow

Or Get Away From Winter
Visit the Linnaean House
where camellias and
rhododendrons bloom

Spend a brief time in the tropics
of the Climatron
Or zip to the southwest in the
American Desert House

STATEMENT OF THE OWNERSHIP, MANAGEMENT AND CIRCULATION (ACT OF OCTOBER 23, 1962, SECTION 4369, TITLE 39, UNITED STATES CODE.)

1. Date of Filing: November 16, 1973
2. Title of Publication: MISSOURI BOTANICAL GARDEN BULLETIN
3. Frequency of Issues: 10 issues per year, monthly except for the months of January and August.
4. Location and Headquarters of Publication: 2315 Tower Grove Avenue, St. Louis, Missouri 63110
5. The names and address of the publisher, editor and managing editor are:
   Publisher: Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Missouri 63110
   Editor: Lorine Compton
6. That the owner is: Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Missouri 63110
7. That the known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: None
8. The purpose, function and nonprofit ststus of this organization and the exempt status for Federal income tax purposes has not changed during preceding 12 months. Authorized to mail at special rates.
9. Extent and nature of circulation:

		average no. copies each issue during preceding 12 months	actual no. of copies of single issue nearest to filing date
A.	Total no. copies printed **(Net Press Run)**	5,500	5,500
B.	Paid Circulation		
	1. Sales through dealers and carriers, street vendors and counter sales	None	None
	2. Mail subscriptions	4,476	4,657
C.	Total paid circulation	4,148	4,329
D.	Free distribution (including samples) by mail, carrier or other means	328	328
	Copies distributed to news agents, but not sold	None	None
E.	Total distribution	4,476	4,657
F.	Office use, left-over unaccounted, spoiled after printing	1,024	8 843
G.	Total **(Sum of E & F — should equal net press run shown in A)**	5,500	5,500

I certify that the statements made by me above are correct and complete.

(signed) LORINE COMPTON, Director of Publications

Gardening in St. Louis

DECEMBER GARDENING

This is the best time of year to catch up on the many and often most pleasant details of gardening there never seem time for in the planting season.

Read! Settle back and enjoy your own garden library. Acquaint yourself with the new books at the Garden Gate Shop and those offered on almost every publisher's Christmas list especially for gardeners. Visit your public library and look over its stock of garden books — and don't neglect the older ones. The best of them contain a mine of good information and advice.

Subscribe to one (or more) good gardening magazine (**Horticulture**, published by the Massachusetts Horticultural Society is an excellent one). A subscription of this sort makes an ideal Christmas gift for gardening friends, as does a year's membership to the Missouri Botanical Garden.

Seed catalogues should be sent for now so that you will be able to place your seed orders early in the New Year.

Garden tools should be cleaned, oiled, sharpened and generally put in proper working order ready for the spring season.

Bird feeders should be in place and well supplied with food. Scraps of suet will attract the downy woodpeckers, nuthatches and others. The book, SONGBIRDS IN YOUR GARDEN, is a fine source of information on selecting bird attracting plants and their care. It also provides detailed plans for building bird houses and advice about their most advantageous location.

Mulch the late planted bulb and perennial beds to protect the plants from heaving due to heavy frosts from now on. This is the last chance to add needed mulch to roses if this was not done earlier. Evergreens planted in the past month or two should have a good mulch placed around them now to prevent frost from penetrating too low. Evergreens need to be able to take moisture up through the roots on mild days. Check mulched areas around all plants to see that mice are not present. Mice chew the bark off young plants causing them to die back.

Stake newly set out trees to prevent them from blowing down in heavy winds.

Hollies may be pruned this month to control shape and growth of the trees. Use the cuttings for holiday decorations in the house.

Cold frames need special attention. In mild weather, airing the frames is important. Prop sashes up a few inches for an hour or so during the warmest part of the day. Water only if they become dry and only during warm spells in the early morning so that plants can dry off. Add extra covering in really cold weather if needed.

The home greenhouse can now be run cooler than earlier in the year. A night temperature of 55-60° with a 5-10° rise during the day is sufficient. Ventilate as needed for fresh air. Watch watering and feeding and don't overdo at this time. Give plants all the light they can receive during these short days. For plants needing more light, six hours per day of extra growing light is best from 6-12 pm. A timer installed saves watching the clock. Watch for insect and disease problems and spray as needed to keep good control.

Amaryllis bulbs may be started now. If these are established bulbs in old pots, two inches of soil should be removed from the surface and replaced with a good, rich mixture.

Fertilizing house plants should, for the most part, be suspended in dull weather. □

CARING FOR YOUR CHRISTMAS PLANTS

Poinsettias — The potted Poinsettia should be kept moderately moist at all times. During the day, it should be placed where it receives good light and, at night, placed in a cool position. While it is flowering actively, feed it once a week with liquid fertilizer. Attempting to carry the plant over for the next Christmas season has proven to be very difficult and is not really recommended. The Poinsettia's flowering time occurs during the time of year when days are shortest. There is too much light in the home throughout the full year which means that, beginning in mid-September, the plant must be in complete darkness (as inside a closet) from 6 pm until 8 am the following morning. Skipping only two or three days of this routine often prevents the plant from flowering at the desired season. If the plant is moved out of doors, it must be pinched continually until mid-July.

Azaleas — Water your Azalea heavily while it is flowering. Every other day, place the pot in a deep container of water so that the top of the potted soil is covered. Leave until all bubbling subsides, then lift out, drain thoroughly and keep the plant as cool as possible. During the day the plant should be near a cool window. For evening, it may be placed back on a table. During flowering, fertilize with liquid fertilizer once a week. Immediately after flowering ceases, the plant should be removed from its original container, half to two-thirds of the growing media (which is usually peat moss) removed, and the plant returned to a pot of the same size as the original. Use a mixture of equal amounts of organic matter (such as compost, decayed leaves, peat moss) and good soil.

Some Perlite may be added for drainage if necessary. After repotting, water well and place in a relatively cool position with good light (an East or West window) during the day, or in the cooler part of the greenhouse. At this stage, the plant will be producing active new growth and may require pinching to keep its shape uniform. It should be fertilized once every two weeks while growth is active. In early April, the Christmas Azalea may be moved outdoors to receive partial sun. Sink the pot into the ground up to its rim. No fertilizer is needed during the summer months, but be sure to keep the plant well watered during dry spells. In late October, the plant should be moved to a cold frame or other protected area and kept moderately moist until brought indoors. Christmas azaleas bloom indoors five or six weeks ahead of ordinary flowering time. Syringing foliage every day will keep your plant healthy and will help prevent buds from drying out. When growth becomes active again, start the light applications of liquid fertilizer as outlined above. It should be noted that Christmas Azaleas are not really hardy in St. Louis and thus should not be left out in the garden permanently unless *very well* protected during freezes.

Cyclamen – The Cyclamen needs to be kept moderately moist and in very cool conditions while flowering. At night, it may be moved to an area where the temperature drops as low as 50°. Should the plant appear to wilt, place the pot in a sink with 2 or 3 inches of water and leave until the top soil has become quite wet. Let the excess water drain off and then place the plant in as cool a place as possible for the next two hours. Cyclamen responds well to strong light during the day. As the flowers die and some leaves turn yellow, they should be removed immediately by grasping the base of the stem and giving a quick twist to remove stem at the base of the bulb. If a portion of the stem is left, it will rot very quickly and can cause other flower buds and leaves to become infected. Fertilize the Cyclamen weekly and once flowering is finished, it is better to throw the plant out than to try to carry it over. Average house conditions are too warm for Cyclamen and there is not sufficient light to keep the plant healthy.

Christmas Begonias – The newest varieties available today are those of the Reiger strain which were developed in Germany and have flowering and keeping qualities superior to those of the old Lady Mac strain. The Begonia grows best under cool, moderately bright conditions and should be kept moist at all times. Care needs to be taken that water is always kept off the leaves to prevent mildew (which is very troublesome once it's allowed to get started). Feed the plant weekly and carefully remove old flower heads. If your plant starts to elongate, it is indicating insufficient light. ☐

THE STAFF RECOMMENDS THREE NEW BOOKS

Perennials for your Garden, by Alan Bloom, Editions Floraisse, 1971 (printed in France for Floraprint, Ltd. Nottingham). An English book, this one is worth tracking down. It contains hundreds of excellent color plates and numerous extremely clear charts and diagrams for border planting. Mr. Bloom's emphasis is on the rich variety of less common kinds of hardy perennials coupled with reliability.

Deciduous Garden Trees and Shrubs, by Anthony Huxley, Macmillan Color Series, 1973, $4.95.

Evergreen Garden Trees and Shrubs, by Anthony Huxley, Macmillan Color Series, 1973, $4.95.

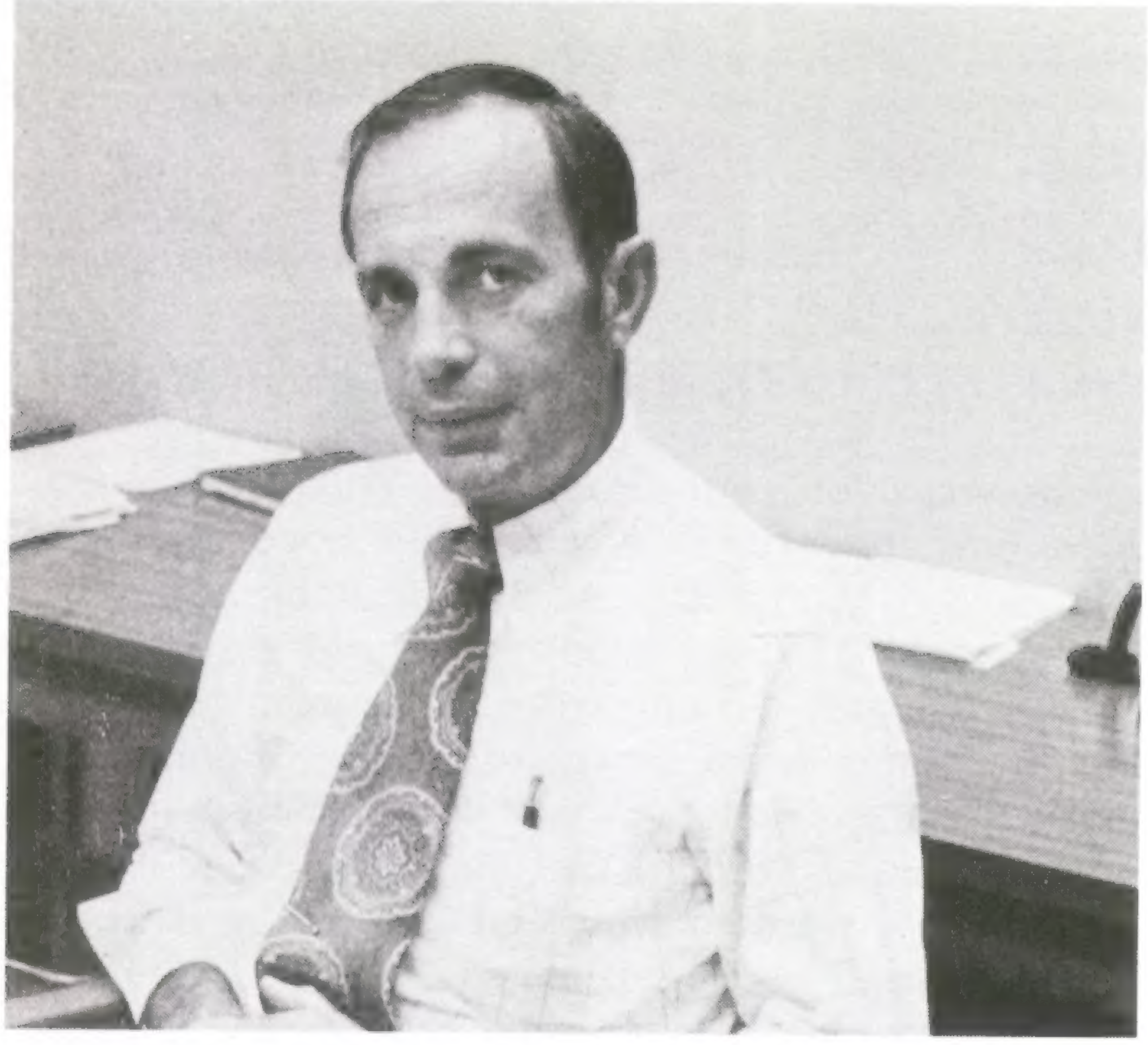
These companion volumes are simple to follow guides to selection and cultivation. In each, hundreds of species are pictured in four-colored illustrations with a special feature of scale drawings to indicate the approximate height, breadth and form of growth in relation to the size of an average house or adult. Accompanying text fully describes each plant and provides notes on soil cultivation. Ideal books for amateurs. Available in the Garden Gate Shop. ☐

THE CHRISTMAS FLOWER SHOW

The 1973 Christmas Flower Show will open in the Floral Display House on December 8th and will be open to the public until about January 13th. In order to give visitors ample walking and viewing space this year, the entire display hall will be devoted to the Christmas flowers.

There will, of course, be the beautiful traditional displays of Poinsettias, Chrysanthemums, Begonias and other favorite Christmas blooming plants. In addition, the staff is hoping this year to include Kalanchoes as well. The Kalanchoe, whose colors range from pale pink to a very deep red, is an old-fashioned plant and was once a familiar holiday decoration. New hybrids, recently developed, have a longer life span and the Garden would like to reintroduce it as an appropriate Christmas plant.

Featured at the center of the hall will be a 20 foot, fully decorated tree. The tree will rise from a large base in the shape of a four-pointed star. Each of the points will be filled with massed Poinsettias. Because of the energy shortage, the tree's lights will be lit only for special occasions. The annual Children's Party is certainly most special and for it, the lights will be ablaze! ☐



CHARLES ORNER APPOINTED CONTROLLER

Charles W. Orner joined the staff of the Missouri Botanical Garden as Controller and new Secretary to the Board of Trustees on July 1st. The responsibilities and concerns of Mr. Orner's position involve the many and varied financial aspects of the Garden's public and scientific services. He, along with his staff in the Garden business office, handle an unusually wide-ranging assortment of money matters – from regulating government grant money to assessing the current national economy in order that the Garden's capital is invested to best advantage. Mr. Orner also studies the resources as well as the needs of each of the Garden's components – in display, research, and education – so that the organization as a whole can both benefit from and contribute to a carefully balanced financial plan. All of this is accomplished in close association with the Board whose members work with Mr. Orner to analyze and develop better methods of managing the general monetary operations of the Garden.

Before coming to the Garden, Mr. Orner directed his own consulting firm which provided bookkeeping, accounting, and tax services for smaller independent businesses. Prior to opening his consulting firm, he was associated with The Morgan Wightman Company, first as Controller, later as Secretary and Controller, and finally as Vice-President in charge of operations.

Mr. Orner was raised in St. Louis County and graduated in 1950 from St. Louis University with a degree in accounting. His interest in the Garden is one of long standing and he comes to serve it with enthusiasm for its aims and for the opportunity to help achieve them.

It is a great pleasure to welcome Charles Orner to the staff of the Missouri Botanical Garden. □

CHRISTMAS AT TOWER GROVE HOUSE

Henry Shaw's country home is charming at any season but, we might say "It was made for Christmas." The moment one walks through the door the fragance of real fir, the spicy odor of pomander balls and freshly baked cookies, give a clue to what awaits the visitor. In the North Parlor is a magnificent tree reaching to the ceiling, decorated with beautiful ornaments, some as old as the House itself. There are the little Christmas tree candles in their old spring-clip candle holders and all over the tree chains of snowy popcorn. For the visitor who can remember, the sight brings a twinge of nostalgia; for the little folks, the wistful hope that next year they can string popcorn for Santa.

In the dining room the table is ready for Christmas dinner and Mr. Shaw's guests. On the white damask cloth Austrian china, banded in deep red and gold, has been set with a ruby glass at each place, a picture of Victorian elegance. The center piece is an arrangement of fresh holly, as are the mantle decorations. Beside the table is the large punch bowl, and on the buffet a steaming plum pudding.

In the old fashioned kitchen, a large spice wreath decorates one wall. Above the sink, opposite the old pump, bunches of fresh spices have been hung up today. On the old cupboard shelf is a large mason jar of peppermint candies, and on the wooden work table, a batch of little gingerbread men has just been set out to cool. On the kitchen table more dough is rolled out, some already cut for cookies. To one side is a bowl of shiny red apples. Could there ever be a kitchen more filled with the warmth and fragrance of old-fashioned cooking at Christmas!

From Friday, December 14, through Monday December 31, New Year's Eve, Tower Grove House will be awaiting Holiday visitors each day from 10:00 a.m. to 4:00 p.m. Come see Christmas as it was celebrated a hundred years ago! □

Member of
The Arts and Education
Fund of Greater St. Louis

The MISSOURI BOTANICAL GARDEN BULLETIN is published 10 issues per year monthly except January and August, by the Missouri Botanical Garden, 2315 Tower Grove Avenue, St. Louis, Mo. 63110. Second class postage paid at St. Louis, Mo.

Lorine H. Compton, Editor

SUBSCRIPTION RATES:
$5.00 per year. $6.00 foreign.

SIMON YBARRA SCULPTURE IN CLIMATRON

Welded steel, stone, wood, ceramic, and mobile sculpture by Simon Ybarra of St. Louis is the third exhibit of art in the Climatron, January 7 through January 27. The principal exhibit is in the new display cases on the Climatron patio; larger works are placed as a part of the environment in the waterfall, the fountain, and planted areas.

The sculptures reflect Mexican life – children in play, mother and child together, musicians and bullfighters in action. The feeling is of a moment of action, caught in a continuum of rhythm and movement. The figures are happy in what they are doing, joyous in everyday pursuits.

Simon Ybarra is currently teaching at John Burroughs School in St. Louis County. He was born in Guanajuato, Mexico, and was trained at the school of art at S. Miguelde Allende with additional study with well known Mexican artists. He has been an exchange teacher at Ohio University in Athens, Ohio, has taught at People's Art Center, St. Louis, and at the Adult Education divisions at University City and Clayton high schools.

He has done commissions for the St. Louis Chancery Office of the Archdiocese; Missouri Baptist Hospital; St. Luke's Hospital; Continental Telephone Company, Winfield, Missouri; and for many private collections.

In addition to having one man shows in galleries in St. Louis, he has had shows in Mexico City, Miami, Chicago, New York, Dallas, and Los Angeles. We are pleased to have a selection of Simon Ybarra's works in the Climatron, several of which he has done specifically for this occasion. ☐

THREE DONATIONS TO THE LIBRARY ON FLOWER ARRANGEMENT

The Garden's library has recently been given three collections of publications primarily devoted to the techniques and history of flower arrangement.

One group of twenty-two volumes, almost all of which are concerned with Ikebana, Moribana, and other schools of Japanese flower arrangement, has been donated by Mr. and Mrs. Ellis C. Littman of St. Louis in memory of Mr. Littman's mother, Augusta F. Littman. Included in this collection are two volumes by John Conder, *The Floral Art of Japan* (1899) and *The Flowers of Japan and the Art of Floral Arrangement* (1891) which are believed to be the first two books on the subject printed in English.

The second collection, consisting of over 35 volumes, 20 pamphlets and 30 prints and illustrations, was a donation from Mr. and Mrs. F. W. Floyd of Potosi. In addition to several books on flower arrangement, there are works on orchids, general gardening, bird identification, wild flower recognition, and other natural history subjects.

The third gift, presented by Mrs. Nedra C. Carp of St. Louis in memory of Irene Anderwert, comprises eighteen volumes on Japanese flower arrangement, and several sets of periodicals relating to Ikebana. Surprisingly, there has been very little duplication among the items included in these three gifts.

To all of these generous donors, as well as to the many other individuals who have given us important gifts in recent months, we extend our sincere appreciation. ☐

CHELSEA – KEW
CHATSWORTH
with the Missouri
Botanical Garden

$775 plus

$75 contribution
to the Missouri
Botanical Garden

May 17 – May 26, 1974

The Missouri Botanical Garden Tour to . . .

THE CHELSEA SHOW of the Royal Horticultural Society – the most extraordinary annual horticultural event in the world – May, 1974, London, England.

Visit the Chelsea Show May 21, Private View Day. Gardens to be seen on this exciting trip include the Royal Botanic Garden, Kew; Wisley, the Garden of the Royal Horticultural Society; and some of the most interesting gardens in southern England.

John E. Elsley, Curator of Hardy Plants at the Missouri Botanical Garden, will escort the group. Mr. Elsley, a former student at Kew and most recently Botanist to the Royal Horticultural Society, has been associated with the Chelsea Show the past five years.

☐ Enclosed is my check for $________($100 per person) as deposit. I understand the total deposit will be refunded if it becomes necessary to cancel.

☐ Please send complete information

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